

Boycovski

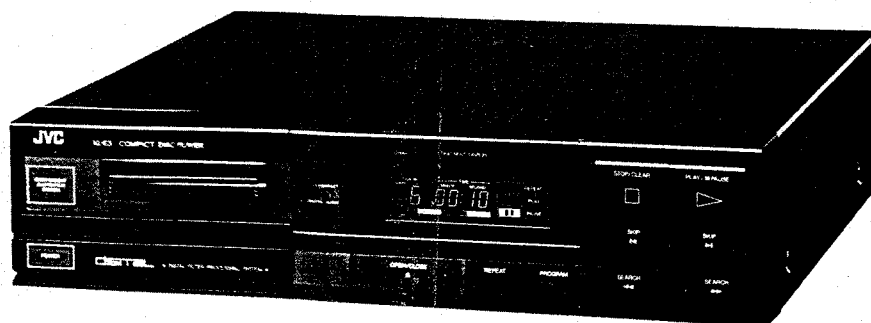
XL-E3BK

JVC

SERVICE MANUAL

COMPACT DISC PLAYER

MODEL No. **XL-E3BK**



COMPACT
disc
DIGITAL AUDIO

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Safety Precautions

1. The design of this product contains special hardware and many circuits and components specially for safety purposes.

For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.

2. Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (Δ) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard.
When service is required, the original lead routing and dress should be observed, and it should be confirmed the they have been returned to normal, after re-assembling.

5. Leakage current check

(Electrical shock hazard testing)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

Do not use a line isolation transformer during this check.

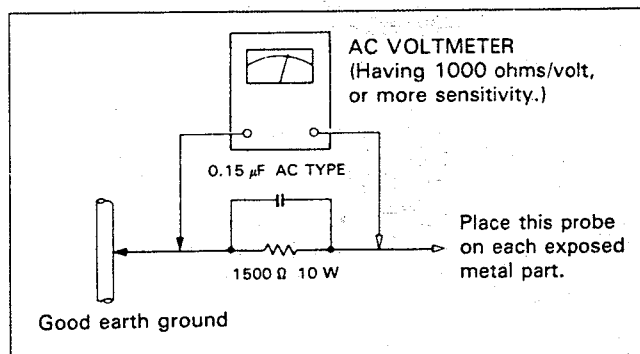
- Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5 mA AC (r.m.s.).

- Alternate check method.

Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10 W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground.

Measure the AC voltage across the resistor with the AC voltmeter.

Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC(r.m.s.). This corresponds to 0.5 mA AC(r.m.s.).



CHECK THE VOLTAGE SELECTOR'S SETTING

(Except for U.S.A., Canada, Australia, U.K. and Continental Europe.)

Before inserting the power plug, please check that the voltage selector's setting corresponds with the line voltage in your area. If it doesn't, be sure to reset the voltage selector before operating this equipment.

The voltage selector may be located on the rear or bottom of the unit, or underneath the platter.

CAUTION: Before setting the voltage selector to the proper voltage, disconnect the power plug.

Important Laser Products

1. CLASS 1 LASER PRODUCT
2. DANGER: Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. CAUTION: There are no serviceable parts inside the Laser Unit.
4. CAUTION: Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.
5. CAUTION: The compact disc player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.
6. CAUTION: If safety switches malfunction, the laser is able to function.
7. CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

VARNING: OSYNLIG LASERSTRÅLNING UPPSTÅR VID KOMPONENTENS ÖPPNING NÄR SÄKERHETSBRYTAREN ÄR FRÄNSLAGEN.

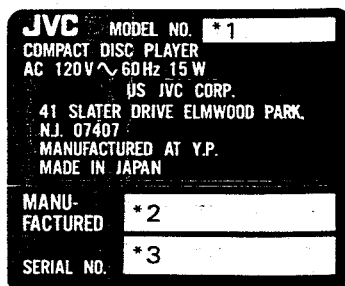
ADVARSEL: USYNLIG LASERSTRÅLNING VED ÅBNING, NÄR SIKKERHEDSABRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

ADVARSEL: USYNLIG LASERSTRÅLNING VED ÅPNING NÄR SIKKERHETSBRYTEREN ER AVSLUTT.
UNNGÅ UTSETTELSE FOR STRÅLING.

VAROITUS: LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ (NÄKYMÄTÖNTÄ) SILMILLE VAARALLISTA LASERSÄTEILYÄ.

REPRODUCTION AND POSITION OF LABELS

IDENTIFICATION LABEL BY DHHS (Only for the U.S.A.)



Note:

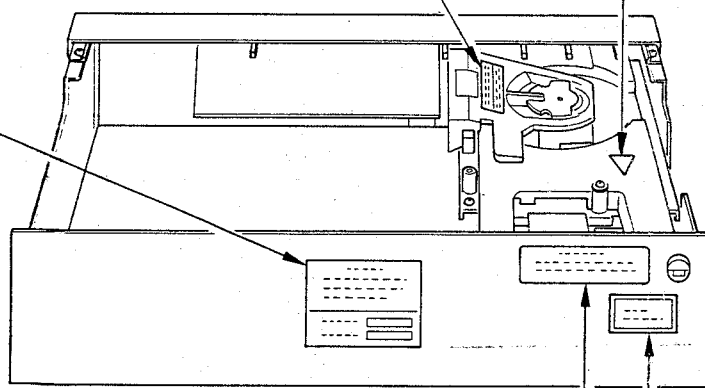
- *1 Model number
- *2 The date of manufacture
- *3 The serial number of production

WARNING LABEL

ADVARSEL Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

DANGER Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM

HAZARD SYMBOL LABEL (Only for Continental Europe)



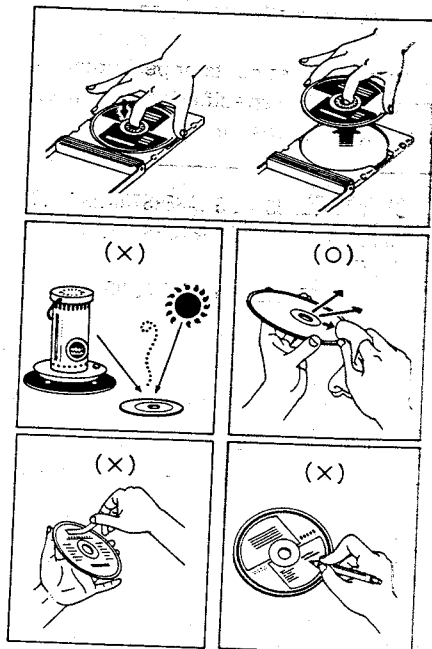
CERTIFICATION
THIS PRODUCT COMPLIES WITH DHHS RULES
21 CFR SUBCHAPTER J APPLICABLE AT DATE
OF MANUFACTURE.

CERTIFICATION LABEL BY DHHS (Only for the U.S.A.)

CLASS 1
LASER PRODUCT

CLASSIFICATION LABEL (Only for Continental Europe, the U.K. and Australia)

HOW TO HANDLE A COMPACT DISC



Since compact discs are plastic, they are easily damaged. If they get dirty, dusty, damaged or warped, the signal will not be picked up correctly, and such discs may cause the player to malfunction. When using a compact disc, take care of the following points:

- Do not touch the surface to be played (reflective silver i.e. the side without the label) when playing or handling the discs.

• Storage

Make sure to keep discs in their cases. If discs are piled on top of one another without cases, they may be damaged. Do not put discs in a place exposed to direct sunlight or in a place with high temperature and humidity. Especially, avoid leaving discs in your car.

• Maintenance of discs

When fingerprints and dirt adhere to a disc, wipe off with a soft and dry cloth. If it is difficult to clean, wipe off with a cloth moistened with water.

- Do not use analog record cleaners, benzene, alcohol or antistatic agent.
- Do not damage the label side or stick paper or adhesive tape to it.

BEHANDLUNG EINER COMPACT-DISC

Da Compact-Discs aus Kunststoff hergestellt sind, können sie leicht beschädigt werden. Bei Beschädigung, Verschmutzung, Staubablagerung oder Deformation kann das Signal nicht korrekt abgelesen werden, wodurch möglicherweise Betriebsstörungen des Players hervorgerufen werden.

Bei Benutzung einer Compact-Disc auf folgende Punkte achten:

- Die Abspielfläche (die silbrig reflektierende bzw. unbedruckte Seite) nicht berühren.

• Lagerung

Eine Compact-Disc stets in der mitgelieferten Schutzhülle aufbewahren.

Werden Compact-Discs ohne Schutzhülle aufeinander gelagert, können sie beschädigt werden. Compact-Discs niemals direktem Sonnenlicht oder hohen Temperaturen bzw. Feuchtigkeit aussetzen. Compact-Discs nicht im Auto liegen lassen.

• Pflege von Compact-Discs

Sind Fingerabdrücke bzw. Schmutz erkennbar, diese mit einem weichen und trockenen Tuch abwischen.

Wenn notwendig, ein mit Wasser angefeuchtetes Tuch verwenden.

- Keinerlei Schallplattenreinigungsmittel, Benzin, Alkohol oder antimagnetische Reiniger verwenden.
- Die Etiquette-Seite nicht beschädigen oder bekleben.

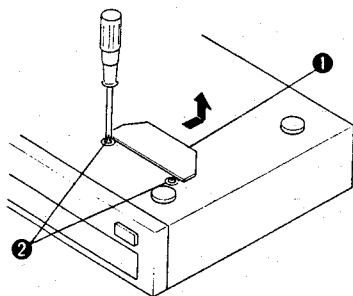
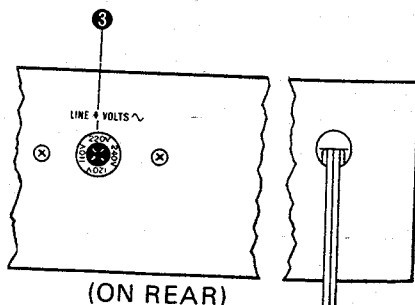


Fig. 3
Abb. 3



(ON REAR)

Fig. 4
Abb. 4

BEFORE USE

Do not insert power plug to the receptacle until completion of all the preparations.

1. Remove a holder ① and two screws ② for transportation. (Fig. 3)

Note:

- Be sure to keep the holder and screws.
- Be sure to prepare for shipment according to the procedures opposite to the above.

2. Set the voltage selector ③ to your local line voltage (Fig. 4)

When this equipment is used in an area where the supply voltage is different from the preset voltage, reset the voltage selector to the correct position.

(Not provided on units for U.S.A., Canada, Australia, U.K. and Continental Europe.)

VOR INGEBRAUCHNAHME

Das Netzkabel erst an die Wandsteckdose anschließen, wenn alle Vorbereitungen durchgeführt wurden.

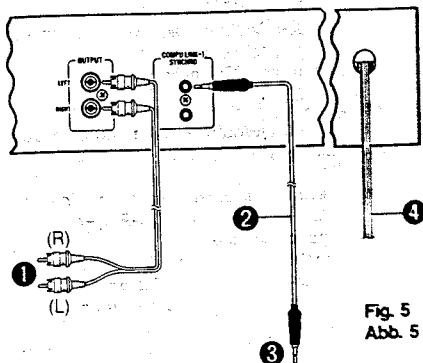
1. Halterung ① und die zwei Schrauben ② für Transportsicherung entfernen. (Abb. 3)

Hinweis:

- Halterung und Schrauben unbedingt aufbewahren.
- Für eventuellen späteren Transport, die oben beschriebenen Maßnahmen in sinnge-
mäßiger Reihenfolge durchführen.

2. Schalten Sie den Spannungswähler ③ auf Ihre örtliche Netzspannung. (Abb. 4)
Wenn die voreingestellte Netzspannung an diesem Gerät nicht mit der tatsächlich vorhandenen übereinstimmt, den Spannungswähler auf den erforderlichen Wert einstellen. (Nicht vorgesehen an den Geräten, die für die USA, Kanada, Australien, Großbritannien und Kontinental-Europa bestimmt sind)

CONNECTION DIAGRAM ANSCHLUSSDIAGRAMM SCHEMA DE RACCORDEMENTS AANSluitingsschema DIAGRAMA DE CONEXIONES



■ Connecting to an amplifier

Notes:

- When connecting any component, set the **POWER** button to off.
- Connect the plugs firmly after confirming the L (Left) and R (Right).

Connect the OUTPUT terminals of the player to the input terminals (CD, AUX or TAPE PLAY) of the amplifier with the provided signal cords as shown in Fig. 5.

(Do not connect to the PHONO terminals of the amplifier.)

■ Connecting to a cassette deck etc.

Connect the COMPU LINK-1/1SYNCHRO terminals of this unit to the COMPU LINK-1/1SYNCHRO terminals of an amplifier, cassette deck, etc. to generate COMPU LINK Control System. Concerning compatible amplifiers or cassette decks, consult your dealer.

■ COMPU LINK CONTROL SYSTEM

This is a convenient system which has been originated and developed by JVC. The following are the brief explanations of its major performances:

Automatic Source Selection

When the provided remote cables are used for connecting this unit to other components which have COMPU LINK-1/1SYNCHRO terminals, the switch-over of all system components is possible with simple one-touch of the source selector button of JVC's amplifier or receiver. By doing this, the corresponding component will start playing automatically. The source select button of the remote control unit or the activation button of the desired component can be also used for this purpose.

When the components have been switched over, the previous component will stop playing within five seconds.

Synchronized Recording

Synchronized recording refers to the process in which the cassette deck starts recording in synchronism with the CD player. Perform the synchronized recording as follows.

1. Set the cassette deck to the REC/PAUSE mode in accordance with the procedures in the instruction manual.
2. If you want the programmed recording, program the desired tunes in any order you wish to hear.

■ Anschluß an einen Verstärker

Hinweise:

- Bei Anschlüssen aller Art die Netzspannung ausschalten.
- Die Stecker auf richtigen (Links/Rechts) Anschluß und sicheren Sitz überprüfen.

Die OUTPUT- Buchsen des Players über die mitgelieferten Kabel mit den Eingangsbuchsen des Verstärkers (CD, AUX oder TAPE PLAY) verbinden, wie in Abb. 5 gezeigt.

(Nicht an den PHONO-Buchsen des Verstärkers anbringen!)

■ Anschluß an ein Cassettendeck u.s.w.

Die COMPU LINK-1/1SYNCHRO-Buchsen dieses Geräts an die COMPU LINK-1/1SYNCHRO-Buchsen eines Verstärkers, Kassettendecks o.a. anschließen, um das COMPU LINK Bedienungssystem zu aktivieren. Ihr Audio-Handler kann Ihnen die zusammenpassenden Geräte vorstellen.

■ COMPU LINK BEDIENUNGSSYSTEM

Dieses bedienungsfreundliche System ist bei JVC erfunden und entwickelt worden. Es folgen kurze Erläuterungen seiner Eigenschaften:

Automatische Quellenwahl

Wenn die mitgelieferten Verbindungskabel zum Anschluß dieses Geräts an andere Komponenten verwendet werden, die mit COMPU LINK-1/1SYNCHRO-Anschluß-buchsen ausgestattet sind, dann lassen sich sämtliche Bauteile mit einem einzigen Druck auf die Quellenwahltaste des JVC-verstärkers oder — Receivers umschalten. Das entsprechende Gerät beginnt dann automatisch zu spielen. Die Quellenwahltaste der Fernbedienung oder die Auslösetaste der gewünschten Komponente kann ebenso dazu verwendet werden. Wenn die Komponenten umgeschaltet sind, wird der Wiedergabebetrieb des vorigen Bauteils innerhalb fünf Sekunden abgebrochen.

Synchronisierte Aufnahme

Synchronisierte Aufnahme ist ein Vorgang, wo das Cassettendeck seinen Aufnahmebetrieb gleichzeitig zum CD-Player aufnimmt. Synchronaufnahmen wie folgend durchführen.

1. Das Cassettendeck gemäß den Anweisungen der Bedienungsanleitung auf Betrieb REC/PAUSE stellen.
2. Für vorprogrammierte Aufnahmen die aufzunehmenden Stücke in der gewünschten Reihenfolge einprogrammieren.

- 1 To the input terminal (CD, AUX or TAPE PLAY) of an amplifier.

Zum Eingangsanschluß (CD, AUX, oder TAPE PLAY) des Verstärkers.

Vers la borne d'entrée (CD, AUX ou TAPE PLAY) d'un amplificateur.

Naar ingangsaansluiting (CD, AUX, of TAPE PLAY) van een versterker.

Hacia el terminal de entrada (CD, AUX o TAPE PLAY) de un amplificador.

- 2 Provided remote cable
Mitgeliefertes Fernbedienkabel
Câble de télécommande fourni
Bijgeleverde afstandsbedieningskabel
Cable de control remote suministrado

- 3 To the "COMPU LINK-1/1SYNCHRO" terminals of an amplifier or a cassette deck.
Zum "COMPU LINK-1/1SYNCHRO" Anschluß eines Verstärkers oder eines Cassettendecks.
Vers la borne "COMPU LINK-1/1SYNCHRO" d'un amplificateur ou d'une platine d'enregistrement.

Naar de "COMPU LINK-1/1SYNCHRO" aansluiting van een versterker of een cassettedeck.

Hacia el terminal "COMPU LINK-1/1SYNCHRO" de un amplificador o magnetófono.

- 4 To the wall outlet.
Zur Netzsteckdose.
Vers une prise secteur.
Naar stopcontact.
Hacia el tomacorriente.

3. Press the PLAY/PAUSE button of the CD player. By so doing, the cassette deck is placed in the record mode and synchronized with the CD player for recording. Synchronized recording thus can be made possible.

Notes:

- Synchronized recording stops automatically when the CD player stops playing.
- To cancel synchronized recording, press the STOP button of the CD player or cassette deck.
- Press the REC and PLAY buttons of the cassette deck when starting in the middle of play.
- During synchronized recording, the operation of the PLAY/PAUSE button is interlocked with the cassette deck.
- When the REC/PAUSE mode is set by pressing PAUSE button after pressing the REC and PLAY buttons simultaneously, synchronized recording is not possible. For details, refer to the instruction manual of the cassette deck.
- Abnormal operation will result if the power supply of the component(s) is interrupted midway. If this happens, press the activation button again to restart.
- Ensure that the COMPU LINK-1/SYNCHRO terminals of individual components are connected with the provided remote cables. Also be sure to read the instruction manual for each component very carefully.
- The source is locked to the CD position during synchronized recording to avoid accidental stops or switch-over to another component. To switch over the components, cancel synchronized recording first.

3. Die PLAY/PAUSE-Taste des CD-Players drücken. Das Cassettendeck wird dadurch auf Aufnahmebetrieb geschaltet und für synchrone Aufnahmen vom CD-Player bereitgestellt.

Hinweise:

- Die Synchronaufnahme wird automatisch abgebrochen, wenn sich der CD-Player abschaltet.
- Zum Ausschalten einer Synchronaufnahme die STOP-Taste am CD-Player oder Cassettendeck drücken.
- Für Aufnahmen, die in der Plattenmitte beginnen sollen, sind die Tasten REC und PLAY am Cassettendeck zu betätigen.
- Während Synchronaufnahmen ist die Funktion der Taste PLAY/Pause mit dem Cassettendeck zusammengeschaltet.
- Wenn man nach gleichzeitigem Betätigen der Tasten REC und PLAY auf Betrieb REC/PAUSE schaltet, indem man die PAUSE-Taste drückt, dann ist keine synchrone Aufnahme möglich. Einzelheiten dazu entnehmen Sie bitte der Bedienungsanleitung des Cassettendecks.
- Es kommt zu Betriebsstörungen, wenn die Stromversorgung eine oder mehrerer Anlagenteile unterbrochen wird. In solch einem Fall ist zum Neustart die Auslösetaste zu drücken.
- Versichern Sie sich, daß die COMPU LINK-1/SYNCHRO-Buchsen einzelner Anlagenteile mit den vorgesehenen Verbindungskabeln versehen sind. Ebenfalls nicht versäumen, die Bedienungsanleitungen der einzelnen Geräte sorgfältig durchzulesen.
- Die Aufnahmequelle ist während der Synchronaufnahme auf die CD-Position festgeschaltet, um ungewolltes Unterbrechen oder Umschalten auf eine andere Anlagenkomponente zu verhindern. Vor dem Umschalten auf ein anderes Gerät ist die Synchronaufnahme daher zuerst abzuschalten.

DESCRIPTION AND FUNCTIONS BESCHREIBUNG UND FUNKTIONEN

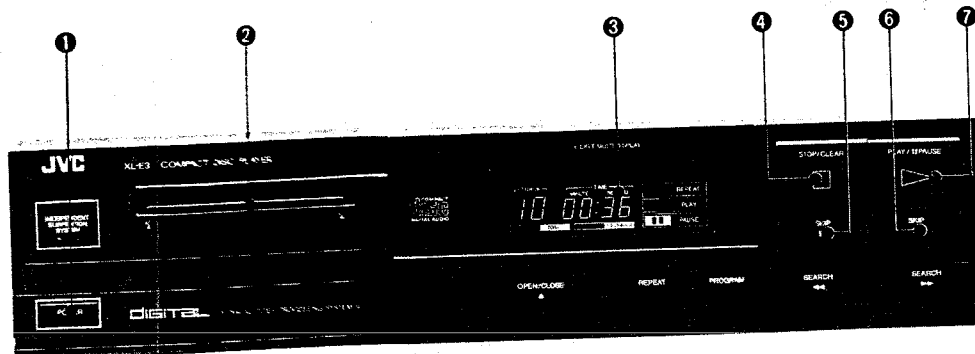


Fig. 6
Abb. 6

1 POWER

Press to switch on the POWER, and the display lights. Press again to switch off the POWER, and the display goes off.

2 Disc platter

Load the disc to be played.

While the disc platter is moving, do not turn the power off or push the disc platter by hands, etc.

3 Display

This shows various program data including playing time, tune number, etc. For more details, see "DISPLAY" on page 1-12.

4 STOP (■)/CLEAR

Press this button once to stop playing and twice to erase the programmed tunes.

5 SKIP (◀) (backward)

Press once during play to return the sensor to the start of the current tune. Press again to return the sensor to the start of the previous tune. Each time it is pressed, the sensor moves backward by one tune. If the button is held down, play will continue to go back one selection at a time until the button is released.

6 SKIP (▶) (forward)

Press once during play to move the sensor to the start of the next tune. Each time it is pressed, the sensor moves forward by one tune. If the button is held down, play will continue to go forward one selection at a time until the button is released.

7 PLAY (▶)/PAUSE (||)

Press this button to start play from the first tune or the programmed play after the loading of a disc is finished. Press this button again to suspend play temporarily; the PAUSE indicator lights. To restart playing, press this button again.

1 Netzspannung (POWER)

Zum Einschalten der Stromversorgung (POWER) betätigen; die Anzeigelampe leuchtet auf. Zum Ausschalten des Netzstroms die Taste noch einmal betätigen; die Anzeigelampe erlischt.

2 Disc-Halter

Die für Abspielbetrieb vorgesehene Disc laden. **Wenn der Disc-Halter bewegt wird, die Spannungsversorgung nicht ausschalten, den Disc-Halter nicht per Hand bewegen etc.**

3 Display

Das Display informiert über verschiedene Programmierdaten, inkl. Wiedergabezeit, Titelnummer etc.. Weitere Angaben im Abschnitt "ANZEIGEN" auf Seite 1-12.

4 STOP (■)/CLEAR-Taste

Taste einmal drücken, um die Wiedergabe abubrechen, bzw. zweimal, um die vorprogrammierten Titel zu löschen.

5 Sprungtaste (SKIP ◀) (rückwärts)

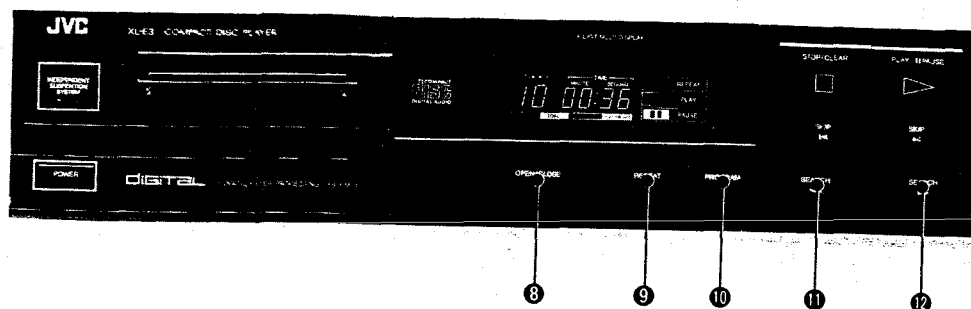
Während der Wiedergabe wird der Abnehmer durch einmaliges Betätigen dieser Taste zum Anfang des jeweils eingestellten Titels gesetzt. Bei nochmaliger Betätigung wird der Abnehmer zum Anfang des jeweils vorherigen Titels gesetzt. Bei Festhalten der Taste bewegt sich der Sensor so lange um jeweils einen Titel zurück, bis man die Taste losläßt.

6 Sprungtaste (SKIP ▶) (vorwärts)

Während der Wiedergabe wird der Abnehmer durch einmaliges Betätigen dieser Taste jeweils zum Anfang des folgenden Titels gesetzt. Jedes Betätigen der Taste setzt den Abnehmer um einen Titel weiter. Bei Festhalten der Taste bewegt sich der Sensor so lange um jeweils einen Titel vorwärts, bis man die Taste losläßt.

7 Wiedergabe/Pause-Taste (PLAY ▶ /PAUSE ||)

Diese Taste betätigen, um die Wiedergabe vom ersten Titel an oder die programmierte Wiedergabe zu starten, nachdem der Ladevorgang beendet ist. Bei nochmaligem Betätigen dieser Taste wird die Wiedergabe zeitweilig unterbrochen; das PAUSE Zeichen leuchtet. Zur Fortsetzung der Wiedergabe diese Taste nochmals betätigen.

Fig. 7
Abb. 7**8 OPEN/CLOSE (▲)**

Press to move the disc platter in and out. Press once and the disc platter will move out; now load a disc and press again to move the platter back in. The disc is now ready to be played. If it is pressed during play, play is interrupted, the program is erased from memory and the disc platter comes out.

9 REPEAT

Press for repeat play of all the tunes on a disc or the programmed tunes. Then the REPEAT indicator lights.

To release the repeat mode, press again and the indicator goes off.

10 PROGRAM

Press this button to program tunes.

The PROGRAM indicator lights when programming or playing back programmed tunes.

11 SEARCH (◀◀) (backward)

Press to search for the required tune by moving the sensor back.

12 SEARCH (▶▶) (forward)

Press to search for the required tune by moving the sensor forward; sound can be heard at reduced volume level while search is taking place in the play mode.

8 Öffnen/Schließen-Taste (OPEN/CLOSE ▲).

Zum Ein- und Ausfahren des Disc-Halters drücken. Einmal drücken, so daß der Disc-Halter ausgefahren wird. Eine Disc laden, und nochmals drücken, so daß der Disc-Halter wieder eingefahren wird. Die Disc ist nun abspielbereit.

Wird diese Taste während der Wiedergabe gedrückt, wird letztere abgebrochen, das Programm aus dem Speicher gelöscht und der Disc-Halter ausgefahren.

9 Wiederholungstaste (REPEAT)

Diese Taste betätigen, um alle oder programmierte Titel zu wiederholen. Die REPEAT Anzeige leuchtet.

Zur Abschaltung der Wiederholungsfunktion die Taste nochmals betätigen; die Anzeige erlischt.

10 Programmtaste (PROGRAM)

Diese Taste betätigen, um Titel zu programmieren.

Bei Programmierung oder Wiedergabe programmierter Titel leuchtet die PROGRAM Anzeige.

11 Suchtaste (SEARCH ◀◀) (rückwärts)

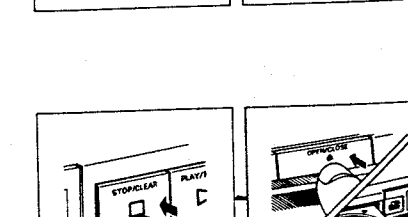
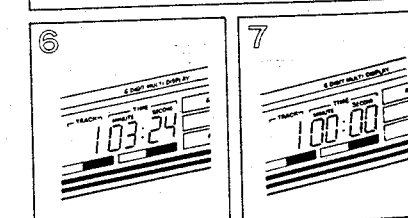
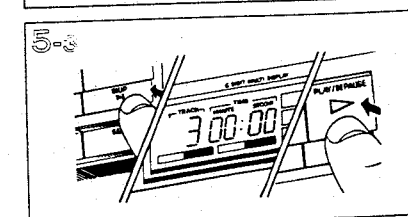
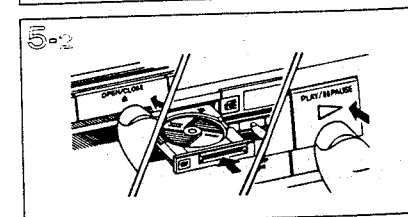
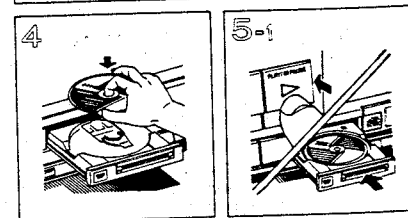
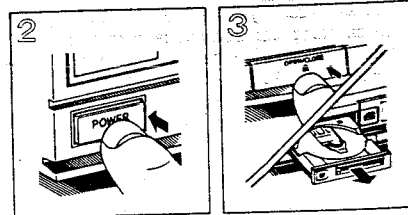
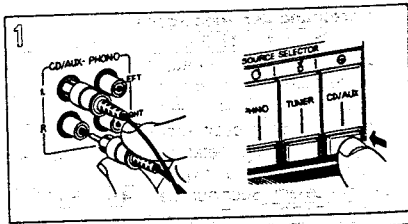
Diese Taste betätigen, um den Abnehmer für Suchlauf bis zu einem gewünschten Titel in Rückwärtsrichtung bewegen.

12 Suchtaste (SEARCH ▶▶) (vorwärts)

Diese Taste betätigen, um den Abnehmer für Suchlauf in Vorwärtsrichtung zu bewegen. Bei Durchführung des Suchlaufs während der Wiedergabe bleibt der Ton bei reduzierter Lautstärke eingeschaltet.

HOW TO OPERATE

BEDIENUNG



Normal play

1. Set the source selector of your amplifier to correspond to the terminals to which the player is connected (CD or TAPE PLAY).
2. Press the POWER button.
3. Press the **▲ OPEN/CLOSE** button to move out the platter.
4. Load a disc with its label up. Make sure the disc fits correctly on the platter.
- 5-1. Press the **▶ PLAY / || PAUSE** button. The platter moves into the player automatically and play starts from the first tune.
- 5-2. Press the **▲ OPEN/CLOSE** button to display the contents of the disc for about 3 seconds. After this, press the **▶ PLAY / || PAUSE** button to begin playback.
- 5-3. When beginning play from the second selection, locate the start of the desired selection by the **▶ SKIP** button, then press the **▶ PLAY / || PAUSE** button to begin playback.
6. During play, the track number and the elapsed time of the selection being played are shown in the display window.
7. When play is finished, the laser pickup moves back to the first tune, and play automatically stops with the operation held on standby.

Note:

- While the disc platter is moving, do not turn the power off or push the disc platter by hands, etc.

Normale Wiedergabe

1. Den Signalewahlschalter des Verstärkers entsprechend dem für den Player gewählten Anschluß einstellen (CD, AUX oder TAPE PLAY).
2. Die POWER -Taste betätigen.
3. Die **▲ OPEN/CLOSE** -Taste betätigen, um den Disc- Halter auszufahren.
4. Eine Compact-Disc mit nach oben zeigendem Etikette einlegen. Auf korrekten Sitz der Compact-Disc achten.
- 5-1. Die **▶ PLAY / || PAUSE** -Taste betätigen. Der Disc-Halter wird eingefahren, und die Wiedergabe startet vom ersten Titel an.
- 5-2. Taste **▲ OPEN/CLOSE** drücken, um die Plattentitel etwa 3 Sekunden lang anzuzeigen. Danach die **▶ PLAY / || PAUSE** Taste betätigen, worauf die Wiedergabe beginnt.
- 5-3. Bei Wiedergabebeginn ab dem zweiten Titel läßt man den Sensor durch Betätigen der **▶ SKIP** Taste zum zweiten Titel vorspringen und drückt dann die **▶ PLAY / || PAUSE** Taste, worauf die Wiedergabe beginnt.
6. Während der Wiedergabe werden Nummer und verstrichene Zeitspanne des laufenden Titels im Anzeigefenster angegeben.
7. Nach Ende der Wiedergabe kehrt der Laser-Tonabnehmer selbsttätig zum ersten Titel zurück, und die Wiedergabe wird abgebrochen, wobei das Gerät in Betriebsbereitschaft bleibt.

Hinweis:

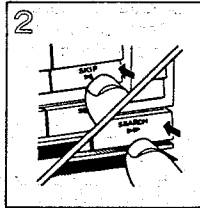
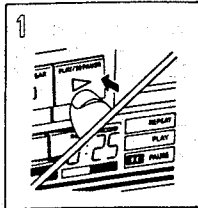
- Solange sich der Disc-Halter bewegt, die Spannungsversorgung nicht abschalten, den Disc-Halter nicht von Hand bewegen etc.

To stop play

- Press the **■ STOP/CLEAR** button; play stops and the player enters the standby mode. (The condition when a disc has been loaded and its contents have been read.)
- To remove the disc, press the **▲ OPEN/CLOSE** button. After removal of the disc, press the **▲ OPEN/CLOSE** button again to retract the disc platter.

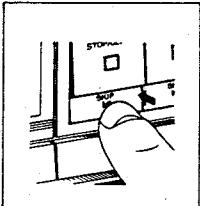
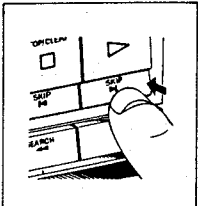
Beenden der Wiedergabe

- Die **■ STOP/CLEAR** -Taste betätigen; die Wiedergabe wird beendet, und der Player wird auf Betriebsbereitschaft geschaltet. (Der gleiche Status wie nach Einlegen und Wiedergabebereitschaft einer Disc und Ablesen des Disc-Inhalts.)
- Zum Entnehmen der Disc die **▲ OPEN/CLOSE** -Taste betätigen. Nach Entnehmen der Disc nochmals die **▲ OPEN/CLOSE** -Taste betätigen, um den Disc-Halter wieder einzufahren.



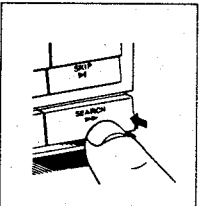
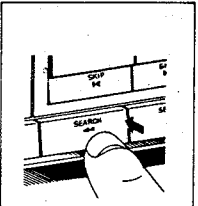
To stop play temporarily

1. Press the **▶ PLAY/II PAUSE** button. The PAUSE indicator lights then play stops with the sensor in the same position.
2. The **◀ SKIP**, **▶ SKIP** buttons and the manual search operation can be performed in the pause mode.
 - To use the manual search function, press the **◀◀ SEARCH**, **▶▶ SEARCH** buttons and scan to the desired position while watching the time display.
3. To restart play, press the **▶ PLAY/II PAUSE** button. The PAUSE indicator will go out.



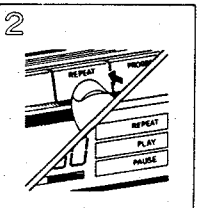
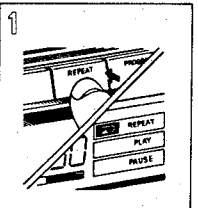
To scan to another tune during play

- Press the **▶ SKIP** button to start play from the start of the next tune. Press the **◀ SKIP** button once to restart play from the start of the current tune. To start play from the previous tune, **press the ◀ SKIP button twice.**
- Since each time the **◀ SKIP**, **▶ SKIP** buttons are pressed, the sensor moves forward or backward in steps of one tune, press them the required number of times.



Manual search

- When either of the **◀◀ SEARCH**, **▶▶ SEARCH** buttons are pressed during play, the sensor moves and you can hear speeded up sound at reduced volume.
- When **◀◀ SEARCH**, **▶▶ SEARCH** buttons are used in the pause mode, operate these buttons while watching the time display as there is no sound.



Repeat play

1. Press the **REPEAT** button to repeat the whole disc or the programmed tunes in the programmed order; the **REPEAT** indicator lights.
2. To release the repeat function, press the **REPEAT** button again.

Unterbrechung der Wiedergabe

1. Die **▶ PLAY/II PAUSE**-Taste betätigen. Die PAUSE-Anzeige leuchtet dann auf, die Wiedergabe wird unterbrochen, und der Sensor bleibt in dieser Position stehen.
2. Bei Pause-Betriebsart können die **◀ SKIP**, **▶ SKIP**-Taste betätigt und der manuelle Suchlauf durchgeführt werden.
- Bei manuellem Suchlauf die **◀◀ SEARCH**, **▶▶ SEARCH**-Tasten drücken, und den Suchlauf zur gewünschten Position unter Beobachtung der Zeitanzeige durchführen.
3. Zur Fortsetzung der Wiedergabe, die **▶ PLAY/II PAUSE**-Taste drücken, worauf das PAUSE Zeichen erlischt.

Titelsuche während der Wiedergabe

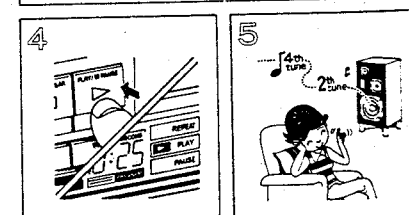
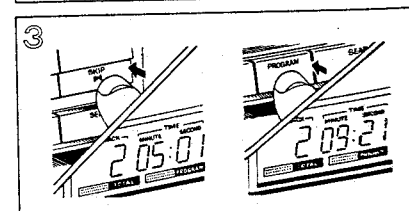
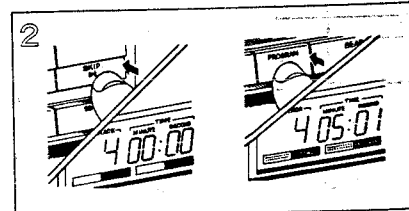
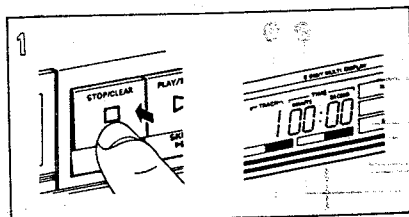
- Die **▶ SKIP**-Taste betätigen, um die Wiedergabe vom jeweils folgenden Titel an zu starten. Die **◀ SKIP**-Taste betätigen, um die Wiedergabe vom jeweils wiedergegebenen Titel erneut zu starten. Um die Wiedergabe vom Beginn des jeweils vorherigen Titels zu starten, **die ◀ SKIP-Taste zweimal betätigen.**
- Mit jeder Betätigung der **◀ SKIP**, **▶ SKIP**-Tasten wird der Abnehmer in Ein-Titel Schritten in Vorwärts- oder Rückwärtsrichtung bewegt, die Taste wie erforderlich betätigen.

Manueller Suchlauf

- Wird eine der **◀◀ SEARCH**, **▶▶ SEARCH** Tasten während der Wiedergabe gedrückt, wird der Abnehmer bewegt, wobei die beschleunigte Tonwiedergabe bei reduzierter Lautstärke erfolgt.
- Werden die **◀◀ SEARCH**, **▶▶ SEARCH** Tasten bei Pausebetrieb betätigt, die Zeitanzeige beachten, da in diesem Fall keine Tonwiedergabe erfolgt.

Wiedergabe-Wiederholung

1. Zur Wiederholung der gesamten Disc oder der programmierten Titel in vorbestimmter Reihenfolge die **REPEAT**-Taste betätigen; die **REPEAT**-Anzeige leuchtet.
2. Zur Abschaltung der Wiederholungsfunktion die **REPEAT**-Taste erneut betätigen.



Programmed play

e.g.: the 4th tune is played first, then the 2nd tune.

1. Press the **STOP/CLEAR** button to set the player to the standby mode.
2. Press the **SKIP** button to show 4 as a track number then press the **PROGRAM** button. When the 4th tune has been programmed, the play time of the 4th tune is displayed.
3. Press the **SKIP** button to show 2 as a track number then press the **PROGRAM** button. When the 2nd tune has been programmed, the total play time of the 2nd and 4th tunes is displayed.
4. Press the **PLAY/PAUSE** button.
5. Then, play starts and proceeds in order of the programmed tunes — the 4th tune first and the 2nd tune next.

Notes:

- A maximum of 15 programs can be selected from 99 tunes.
- When the total playing time of the programmed tunes exceeds 99 minutes 59 seconds, it is not displayed and only center bars are shown in the display.
- When the tune number to be programmed exceeds the 16th, the subsequent playing time indication shows only center bars.
- Since the total playing time of tunes programmed is displayed, it is convenient when recording tapes.
- During programmed play or in the pause mode, pressing the **SKIP** button skips to the next tune in the programmed order.
- To stop temporarily during programmed play, press the **PLAY/PAUSE** button; press this button again to restart.
- When the programmed play is performed, the tune number programmed first and the total playing time of programmed tunes are displayed.

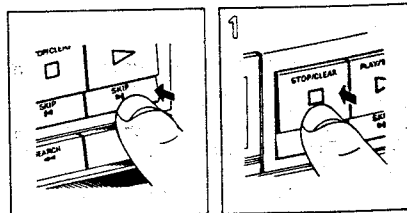
To check or correct the programmed tunes

• Checking the contents of the program

Each time the **SKIP** button is pressed in the pause mode or after starting play, the tune numbers of the programmed tunes are displayed in turn.

• Correcting a program

1. To erase all the programmed musics, press the **STOP/CLEAR** button to enter the disc to the stand-by state, and then press the **STOP/CLEAR** button again.
2. To correct the contents of the program, erase the program in the same manner as in 1, and then restart programming from the beginning.



Programmierte Wiedergabe

Beispiel: Zuerst Wiedergabe des 4. Titels, dann des 2. Titels.

1. Die **STOP/CLEAR** -Taste betätigen, um den player auf Betriebsbereitschaft zu stellen.
2. Die **SKIP** -Taste betätigen, so daß Titelnummer 4 angezeigt wird, dann die **PROGRAM** -Taste betätigen. Nach Programmierung des 4. Titels wird dessen Spielzeit angezeigt.
3. Die **SKIP** -Taste betätigen, so daß Titelnummer 2 angezeigt wird, dann die **PROGRAM** -Taste betätigen. Nach Programmierung des 2. Titels wird die Gesamtspielzeit von 4. und 2. Titel angezeigt.
4. Die **PLAY/PAUSE** -Taste betätigen.
5. Die Wiedergabe beginnt dann in der vorprogrammierten Reihenfolge - der 4. Titel also zuerst und danach der 2. Titel.

Hinweise:

- Aus 99 Titeln können maximal 15 Programme gewählt werden.
- Überschreitet die Gesamtspielzeit der programmierten Titel 99 Minuten, 59 Sekunden, erfolgt keine Zeitanzeige, sondern es erscheinen Mittelstreifen im Display.
- Überschreitet die Zahl der zu programmierenden Titel den 16. Titel, erscheinen anstelle der Spielzeitangabe Mittelstreifen.
- Die Anzeige der Gesamtspielzeit ist bei Bandaufnahmen sehr hilfreich.
- Wird die **SKIP** -Taste bei programmierter Wiedergabe oder in der Pausenfunktion betätigt, erfolgt die Wiedergabe-Fortsetzung beim nächsten, programmierten Titel.
- Soll die programmierte Wiedergabe unterbrochen werden, die **PLAY/PAUSE** -Taste betätigen; zum erneuten Start diese Taste nochmals betätigen.
- Bei programmierter Wiedergabe erscheint die erste programmierte Titelnummer und die Gesamtspielzeit aller programmierter Titel im Display.

Überprüfung und Korrektur der Programmierung

• Überprüfung des Programminhalts

Bei Pausebetrieb oder nach Wiedergabestart bewirkt jedes Betätigen der **SKIP** -Taste die Anzeige der programmierten Titel im Display.

• Programmkorrektur

1. Um alle programmierten Musikstellen zu löschen, die **STOP/CLEAR** -Taste zu nächst einmal drücken, um den Compact Disc-Player in Bereitschaftsbetrieb zu setzen und anschließend die **STOP/CLEAR** Taste noch einmal drücken.
2. Zur Korrektur von Programminhalten, das Programm zunächst wie in Abschnitt 1 löschen und die gewünschten Stellen neu programmieren.

DISPLAY

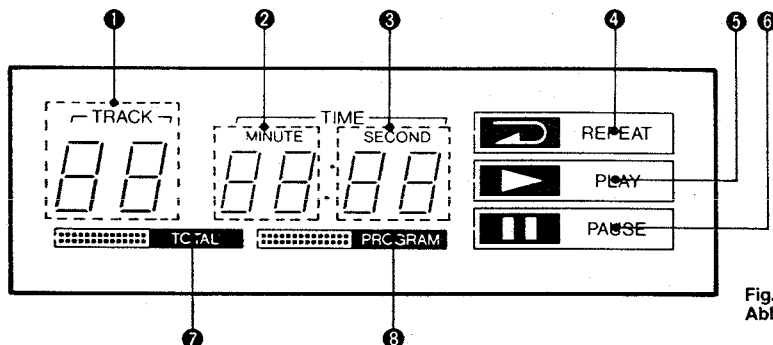


Fig. 8
Abb. 8

- ① The total number of tunes is displayed for about 3 seconds when a disc has been loaded and set for play. The track number of the current tune is displayed while a disc is being played.
- ② The elapsed playing time appears in minutes.
- ③ The elapsed playing time appears in seconds.
- ④ This mark lights when the REPEAT button is pressed.
- ⑤ This mark lights during play.
- ⑥ This mark lights in the pause mode.
- ⑦ TOTAL lights when a disc has been loaded or during programming.
- ⑧ This mark lights during programming.

- ① Nach Laden und Wiedergabeeinstellung einer Kompaktplatte wird die Anzahl der gesamten Titel 3 Sekunden lang im Anzeigefenster angegeben. Die Nummer des gegenwärtigen Titels wird während der Wiedergabe angezeigt.
- ② Die verstrichene Spielzeit wird in Minuten angegeben.
- ③ Die verstrichene Spielzeit wird in Sekunden angegeben.
- ④ Dieses Symbol leuchtet bei Betätigen der REPEAT-Taste auf.
- ⑤ Dieses Symbol leuchtet während der Wiedergabe auf.
- ⑥ Dieses Symbol leuchtet im Pausenbetrieb auf.
- ⑦ Die Anzeige TOTAL leuchtet auf, wenn eine Kompaktplatte geladen wurde, oder aber während des Programmierens.
- ⑧ Dieses Symbol leuchtet während des Programmierens auf.

TROUBLESHOOTING

What appears to be a malfunction may not always be serious.

Make sure first ...

The POWER is not applied even when the POWER button is pressed.

Is the power plug connected incorrectly?

— Connect the power plug firmly and correctly.

The search does not start even if the disc platter is retracted.

Is the disc upside down?

— Load the disc with the label facing up.

Is the disc dirty?

— Clean the surface of the disc.

Refer to "Maintenance of discs" on page 1-4.

Are there scratches on the surface of the disc?

— Change the disc.

Are the holder and screws for transportation removed?

— Remove them referring to BEFORE USE on page 1-4.

STÖRUNGSSUCHE

Nicht jede Störung ist auf einen Schaden zurückzuführen.

Zuerst überprüfen ...

Die POWER-Anzeige leuchtet nicht, obwohl die POWER-Taste gedrückt wurde.

Ist das Netzkabel nicht korrekt angeschlossen?

— Das Netzkabel fest und richtig anschließen.

Der Suchlauf startet nicht, obwohl der Disc-Halter eingefahren ist.

Liegt die Compact-Disc verkehrt herum in der Halterung?

— Die Compact-Disc richtig, mit der Etikettenseite nach oben einlegen.

Ist die Compact-Disc verschmutzt?

— Die Oberfläche reinigen.

Siehe "Pflege von Compact-Discs" auf Seite 1-4.

Ist die Compact-Disc verkratzt?

— Eine andere Compact-Disc einlegen.

Sind Halter und Transportschrauben abgenommen?

— Entfernen Sie sie gemäß den Angaben unter VOR DEM BETRIEB auf Seite 1-4.

SPECIFICATIONS

TECHNISCHE DATEN

System	: Compact disc player
Signal detection system	: Non-contact optical system pickup
Number of channels	: 2 channels
Frequency response	: 5 Hz — 20,000 Hz
Dynamic range	: 92 dB (1 kHz)
Signal/noise ratio	: 98 dB
Channel separation	: 88 dB (1 kHz)
Total Harmonic Distortion	: 0.005%
Wow and flutter	: Less than measurable limit
Output level	: 2.0 Vrms (full scale)
Number of program steps	: 15 steps
Power source	: Refer to the table on back page.
Power consumption	: Refer to the table on back page.
Dimensions	: 340(W) x 83(H) x 291(D) mm (13-7/16" x 3-5/16" x 11-1/2")
Weight	: 3.3kg (7.3 lbs)
Accessories	: Signal cord 1 Remote cable 1 (1 m) 1

System	: Compact-Disc-Player
Signal-Abtastsystem	: Kontaktloser optischer Abnehmer
Anzahl der Kanäle	: 2
Frequenzbereich	: 5 Hz — 20,000 Hz
Dynamikbereich	: 92 dB (1 kHz)
Signalrauschabstand	: 98 dB
Kanaltrennung	: 88 dB (1 kHz)
Klirrfaktor	: 0.005%
Gleichlaufschwankungen	: Unterhalb der Meßgrenze
Ausgangsleistung	: 2.0 V (Maximal-Einstellung)
Programmschritte	: 15
Spannungsversorgung	: Siehe Tabelle auf der letzten Seite
Leistungsaufnahme	: Siehe Tabelle auf der letzten Seite
Abmessungen	: 340(B) x 83(H) x 291(T) mm
Gewicht	: 3.3 kg
Zubehör	: Signalkabel 1 Fernbedienkabel (1 m) 1

Technische Änderungen vorbehalten

Design and specifications subject to change without notice.

POWER SPECIFICATIONS

Areas	Line Voltage & Frequency	Power Consumption
U.S.A.	AC120V~, 60Hz	15 watts
Canada		
Continental Europe	AC220V~, 50Hz	
U.K.	AC240V~, 50Hz	
Australia		
Other areas	AC110/120/220/240V~ selectable, 50/60Hz	

SPANNUNGSVERSORGUNG UND LEISTUNGS-AUFNAHME

Länder	Spannung und Frequenz	Leistungsaufnahme
U.S.A.	120V~Wechselstrom, 60Hz	15 Watt
Kanada		
Kontinental-Europa	220V~Wechselstrom, 50Hz	
Großbritannien	240V~Wechselstrom, 50Hz	
Australien		
Andere Länder	110/120/220/240V~Wechselstrom(umschaltbar),50/60Hz	

Description of Major LSI ICs

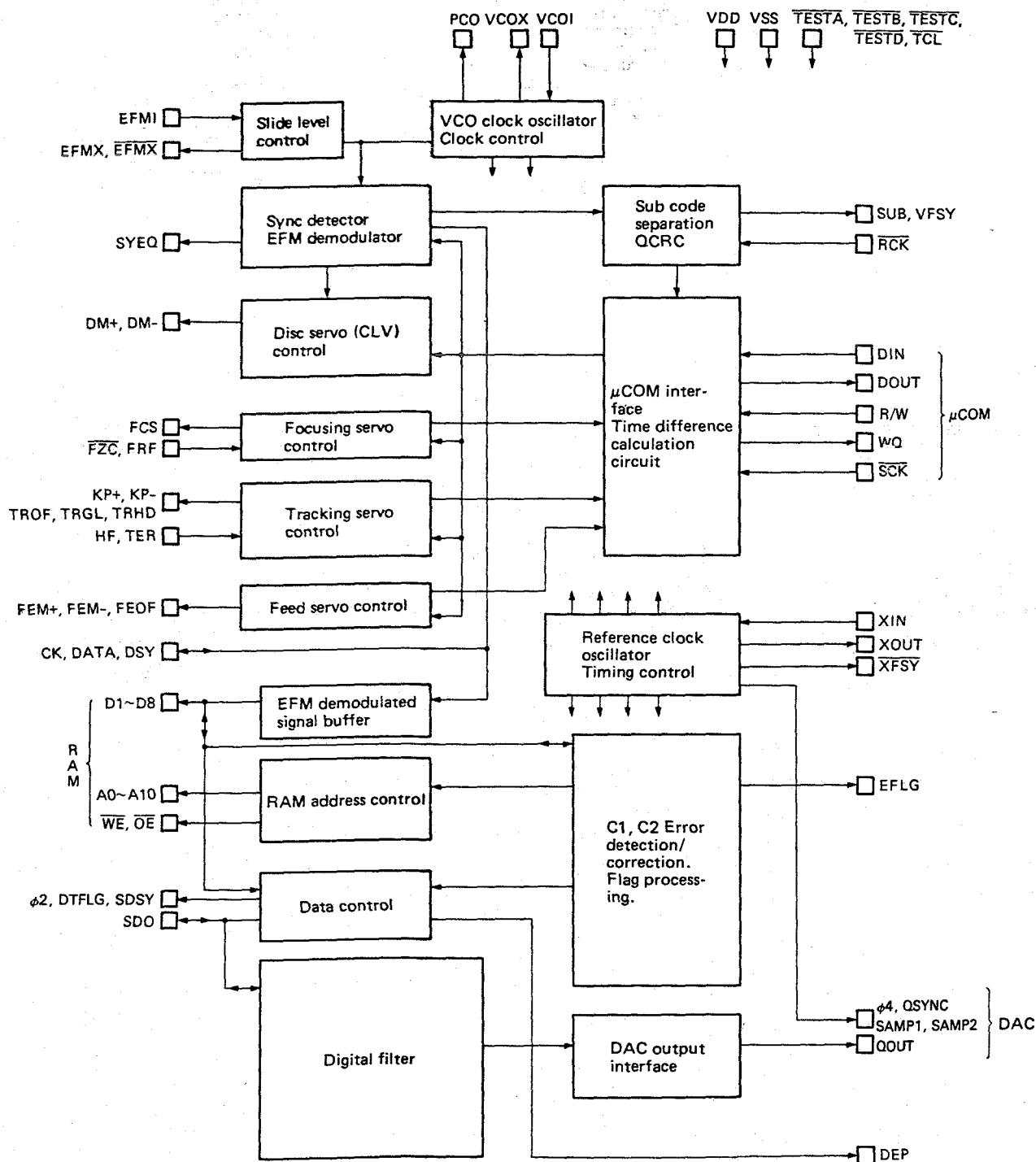
■ IC301: YM3815

(1) Outline:

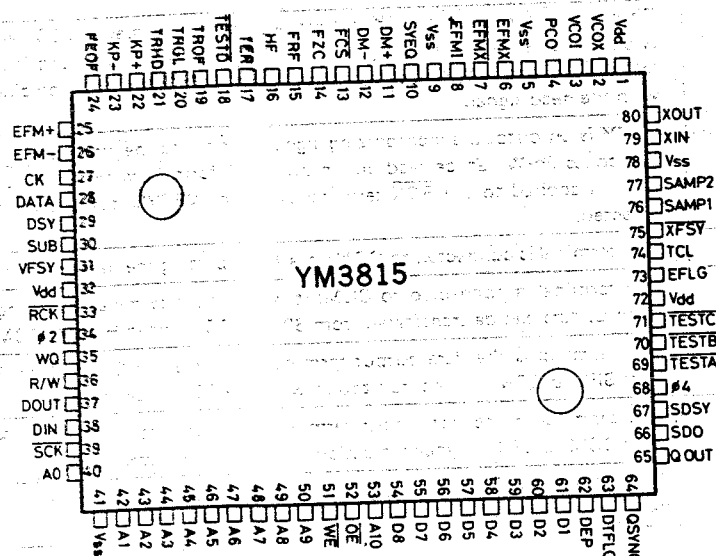
YM3815 is a C-MOS LSI for signal processing (SGP) and servo control (SVC) in a CD player. It is used for the demodulation of the EFM signal from the photo pickup,

detection/correction of the error signal, signal processing in digital filtering, etc. and for various servo controls (focusing, disc, tracking and feed servos).

(2) Internal block diagram



(3) External diagram



(4) Pin function

Pin No.	Pin Name	I/O	Function
1 32 72	VDD	—	These are +5 V power supply terminals.
2 3	VCOX VCOI	O I	A clock pulse (average: 8.6436 MHz) is generated when an LC resonance circuit is connected to these terminals.
4	PCO	O	This terminal outputs the phase difference when the polarity of the clock and the EFM pattern changes; when the polarity becomes positive (+), the polarity of the variable-capacitance diode is set to that the frequency will rise, and clock regeneration is enabled.
5 9 41 78	Vss	—	These are ground terminals.
6 7	EFMX EFMX	O O	These terminals are connected to the EFM signal slice level control circuit. Amplification-limited, mutually antiphased signals are generated.
8	EFMI	I	The EFM signal (1~2 Vp-p) is input over this terminal.
10	SYEQ	O	This is the check output terminal; it becomes high when the synchronizing signal from the internal counter and the cynchronizing signal detected from the EFM pattern coincide with one another.
11 12	DM+ DM-	O O	These terminals output the PMW for the spindle motor drive circuit. The spindle motor speeds up when DM+ is H, and slows down when DM- is H; both terminals cannot be H simultaneously.
13 14 15	FCS FZC FRF	O I+ I	These terminals output signals for controlling the focus servo. The FC5 signal activates the focusing (drawing) operation; the FZC signal, generated when the focus point is achieved, terminate the focusing operation; and the FCO flag is dropped internally at the FRF signal generated when reflected light is detected.
16 17 19 20 21 22 23	HF TER TROF TRGL TRHD KP+ KP-	I I O O O O O	When tracks are being crossed during searches, the amplitude variation of the generated HF signal is sampled at the zero-cross point of the tracking error signal TER and the TROF signal is output. The level variations of this signal turn the servo on and off, greatly facilitating track acquisition. KP+ or KP- is output to conduct tracking, and TRHD is output during tracking to cause generation of the tracking error signal. The TRGL signal is for increasing the tracking gain after tracking is completed.
24 25 26	FEOF FEM+ FEM-	O O O	The FEM+ and FEM- high-speed feed signals are output over these terminals, as is the TEOF signal for cutting the feed servo. These terminals are all at the low level during normal PLAY operations.

Pin No.	Pin Name	I/O	Function
27	CK	I/O	These are check terminals. CK outputs a clock pulse equal to VCO halved, i.e., 4.3218 MHz. DATA is output as a 17-bit serial signal at the above-stated bit rate and includes the 8-bit EFM demodulation signal and the 5-bit data control signal. DSY is the synchronizing signal; it becomes H in time with the head signal.
28	DATA	I/O	
29	DSY	I/O	
30	SUB	O	VFSY is an output, synchronizing signal combining the frame and the sub-code frame (frame 98). Sub-codes P~W can be read out in bit serial form from the SUB output terminal if an eight-fold clock is applied to the $\overline{RCK}$ terminal when the VFSY's level change from H to L can be externally detected.
31	VFSY	O	
33	$\overline{RCK}$	I+	
35	WQ	O	This terminal is connected to COM; it is for inputting the data transfer (SPC to COM) request signal.
36	R/W	I	This terminal is connected to COM; it is the input terminal for changing the data transfer mode: when L, data can be transferred from SPC to COM; when H, from COM to SPC.
37	DOUT	O	This terminal is the data output terminal connected to COM. When R/W is L, data is transferred from SPC to COM in synchronization with the SCK clock input.
38	DIN	I	This terminal is the data input terminal connected to COM. When R/W is H, data is transferred from COM to SPC in synchronization with the SCK clock input.
39	$\overline{SCK}$	I	This terminal is connected to COM; it is an input terminal that carries the clock signal necessary for data transfers.
40	A0	O	These are address output terminals and are connected to the RAM.
42	A1		
50	A9		
53	A10		
51	$\overline{WE}$	O	This terminal is connected to the RAM; the RAM is set to the write mode when this terminal is L.
52	$\overline{OE}$	O	This terminal is connected to the RAM; the RAM is set to the read mode when this terminal is L.
54	D8	I/O	These are data I/O terminals and are connected to the RAM. They are in the data output state when WE is L, and in the data input state when WE is H.
61	D1		
62	DEP	O	This terminal carries the frequency characteristic control signal. De-emphasis is necessary when this terminal is H.
64	QSYNC	O	QOUT (serial output signal for DAC) outputs 16-bit serial data in the 2's comp. format in synchronization with 4.3218 MHz signal from $\phi 4$. SAMP1 and SAMP2 output deglitcher signals for L-ch and R-ch respectively.
65	QOUT	O	
68	$\phi 4$	O	
76	SAMP1	O	
77	SAMP2	O	
34	$\phi 2$	O	Not used
63	DTFLG	O	
66	SDO	I/O	
67	SDSY	O	
69	TESTA	I+	
70	TESTB	I+	
71	TESTC	I+	
73	EFLG	O	
74	TCL	I+	
75	XFSY	I/O	
79	XIN	I	Oscillation is conducted when a crystal resonator (8.6436 MHz) is connected between these two terminals, and 10 pF capacitors are connected between each terminal GND.
80	XOUT	O	

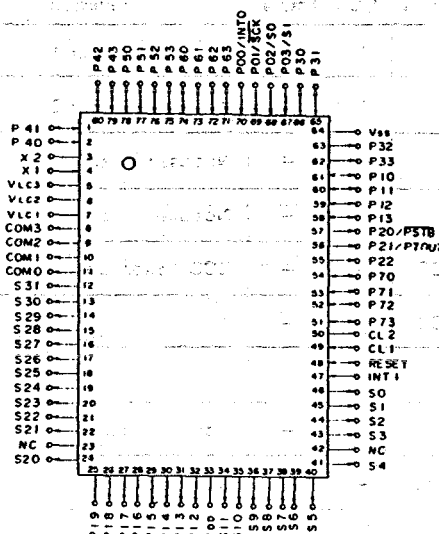
■ IC201: μ PD7514G-209-12

(1) Outline:

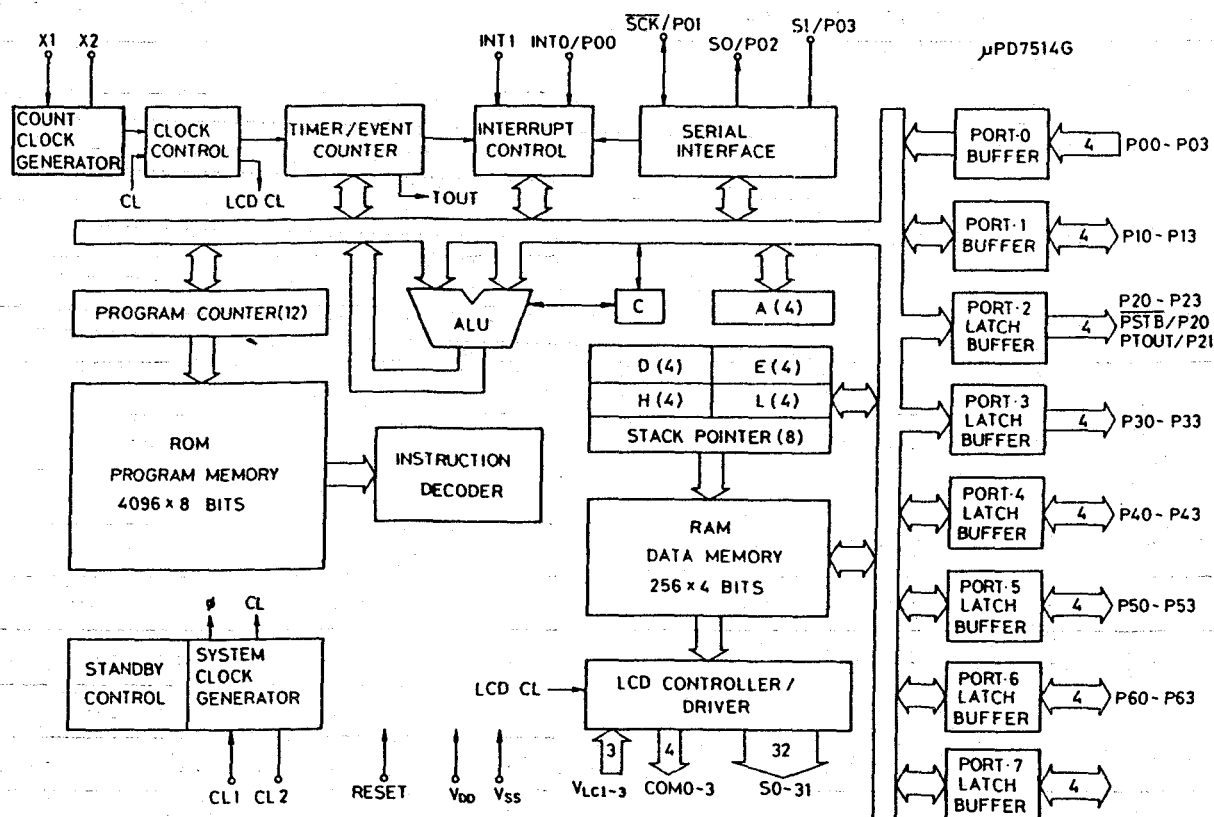
This IC is a C-MOS 4-bit single chip microcomputer, consisting of 4096 word $\times$ 8-bit ROM, 256 digit $\times$ 4-bit RAM, In/Out circuit, timer/counter and serial interface.

Its main function is to accept signals from the operation switches, input/output DCS signals, control the display LCD and output operation commands to the servo control LSI.

(2) Terminal Layout



(3) Internal Block Diagram



(4) Key Matrix

		3 <P43>	2 <P42>	1 <P41>	0 <P40>
0	<P30>	OPEN CLOSE	—	STOP CLEAR	PLAY PAUSE
1	<P31>	—	—	SKIP L	SKIP R
2	<P32>	—	—	MANUAL SEARCH L	MANUAL SEARCH R
3	<P33>	—	—	PROGRAM	REPEAT

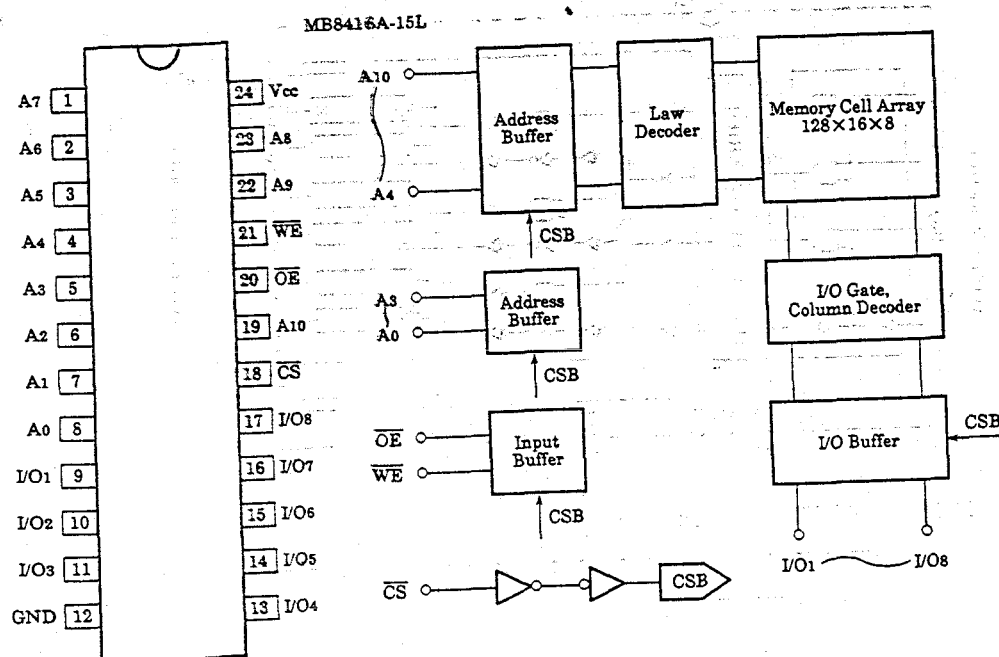
(5) Pin Functions of IC201: μ PD7514G-209-12

Pin No.	Pin Name	I/O	Active	Function
1	P41	I	H	Key matrix input 1
2	P40	I	H	Key matrix input 2
3	X2	—	—	Not used (open)
4	X1	—	—	Not used (Vss)
5	VLC3	—	—	LCD power supply
6	VLC2	—	—	
7	VLC1	—	—	
8	COM3	—	—	Not used (open)
9	COM2	—	—	Not used (open)
10	COM1	O	H	Common output 1
11	COM0	O	H	Common output 2
12	S31	—	—	Not used (open)
19	S24	—	—	Not used (open)
20	S23	O	H	Segment 23 output
22	S21	O	H	Segment 21 output
23	NC	—	—	(open)
24	S20	O	H	Segment 20 output
32	S12	O	H	Segment 12 output
33	VDD	—	—	+5 V power supply
34	S11	O	H	Segment 11 output
41	S4	O	H	Segment 4 output
42	NC	—	—	(open)
43	S3	O	H	Segment 3 output
46	S0	O	H	Segment 0 output
47	INT 1	I	—	Not used (Vss)
48	RESET	—	H	Reset input (Active H)
49	CK 2	—	—	C-R oscillator

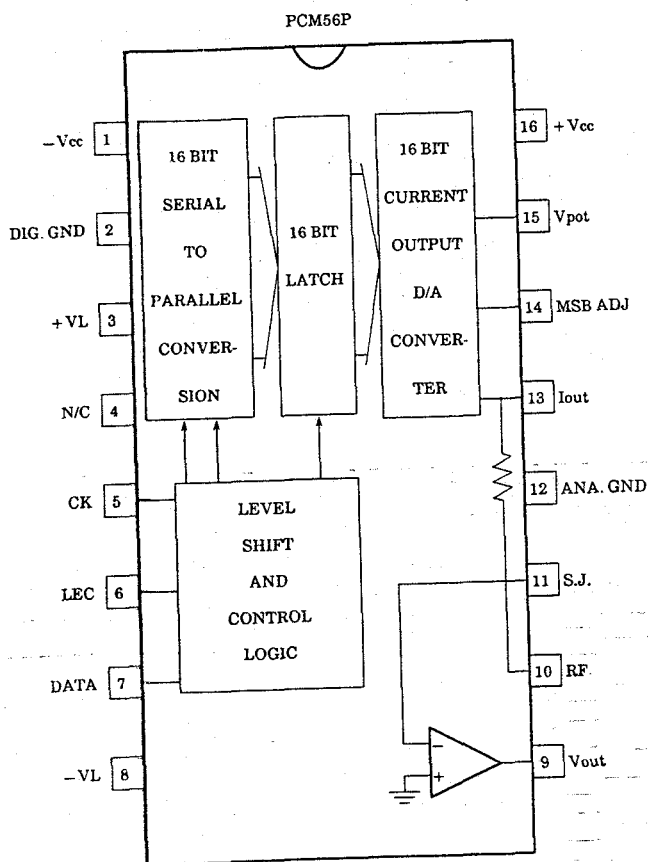
Pin No.	Pin Name	I/O	Active	Function
50	CK 1	—	—	C-R oscillator
51	NC	—	—	Not used (Open)
52	NC	—	—	Not used (Open)
53	NC	—	—	Not used (Open)
54	P70	O	L	Display drive
55	P22	O	H	TLOF
56	P21	O	H	GU
57	P20	O	H	SVC connect R/W
58	P13	I	H	SVC connect WQ
59	P12	I	L	Test 2 clock signal output (Pull-up)
60	P11	I	L	Test 1 time output OFF (Pull-up)
61	P10	—	—	Ground
62	P33	O	H	Key matrix output 3
63	P32	O	H	Key matrix output 2
64	Ugg	—	—	GND
65	P31	O	H	Key matrix output 1
66	P30	O	H	Key matrix output 0
67	P03	—	H	SVC connect D-OUT
68	P02	O	H	SVC connect D-IN
69	P01	O	L	SVC connect SCK
70	P00	—	—	Not used (Vss)
71	P63	O	H	Laser ON (Active H)
72	P62	O	H	Close output
73	P61	O	H	Open output
74	P60	O	L	DCS output (Active L)
75	P53	I	H	Rest switch
76	P52	I	H	Open switch
77	P51	I	H	Close switch
78	P50	I	L	DCS input (Active L)
79	P43	I	H	Key matrix input 3
80	P42	I	H	Key matrix input 2

Other LSI ICs and Internal Block Diagrams

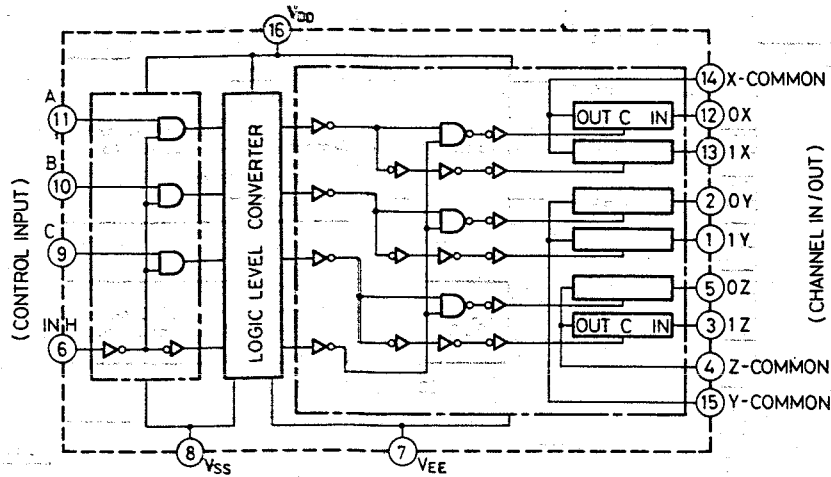
IC302: MB8416A-15L-SK (Static RAM)



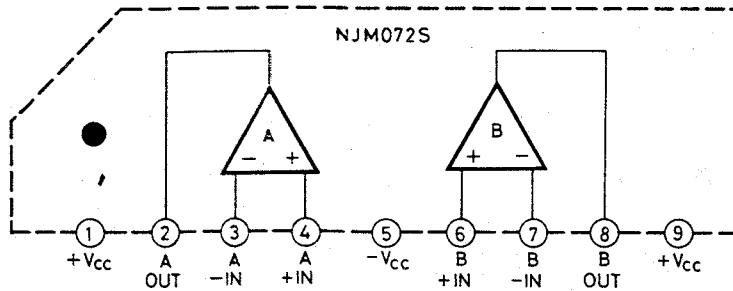
IC303: PCM56P (D/A converter)



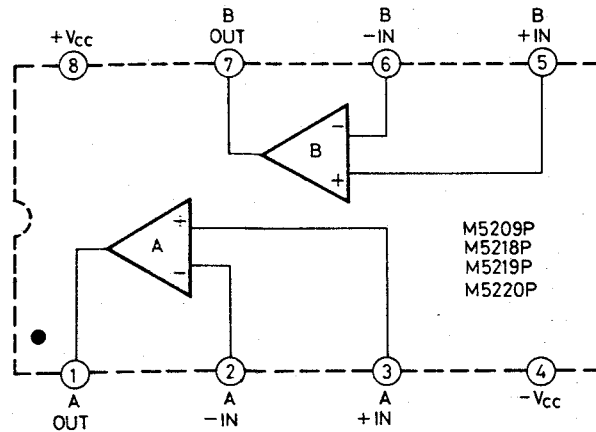
IC304: BU4053B (Analog SW, Multiplexer)



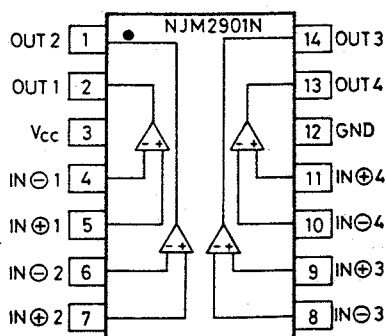
IC501: NJM072S (Dual op amp)



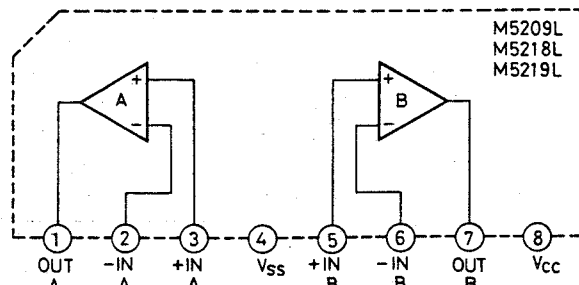
IC401: M5209P (Dual op amp)



IC502: NJM2901N (Quad comparator)



IC251, IC306, IC307, IC503, IC802, IC851: M5218L (Dual op amp)



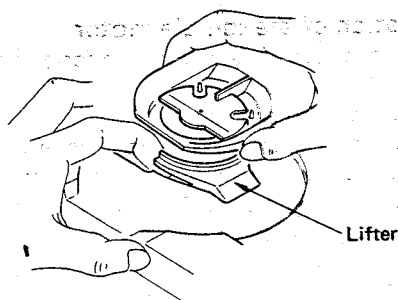
Disassembly Procedures

(1) Metal cover removal

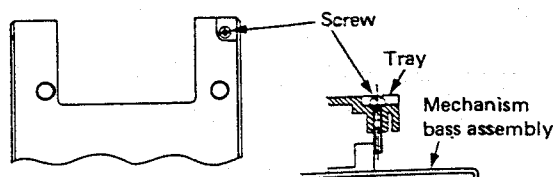
1. Remove the five screws.
2. Remove the metal cover by lifting its top and pulling it backwards at an angle to the rear and up.

(2) Tray assembly removal

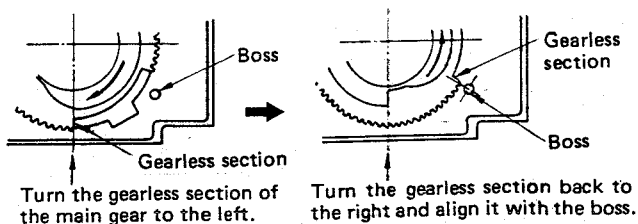
1. Remove the metal cover.
2. Turn the power on and press the OPEN/CLOSE switch to move out the tray. After this, turn the power off.
- * If the power cannot be turned on due to a malfunction, pull out the tray while forcibly raising the lifter.



3. Remove the tray stopper screw and remove the tray by pulling it toward you.



4. When reassembling, first turn the gearless section of the main gear to the left, then turn it back to the right and align it with the boss on the mechanism base ass'y (by visual inspection) before installing the tray.



(3) LCD printed circuit board removal

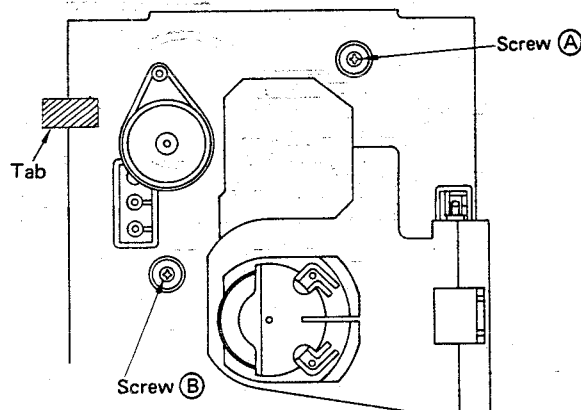
1. Remove the two plastic rivets.
2. Remove the LCD PC board by sliding it backwards.
3. Be careful not soil the LCD surface by touching it.

(4) Front panel assembly removal

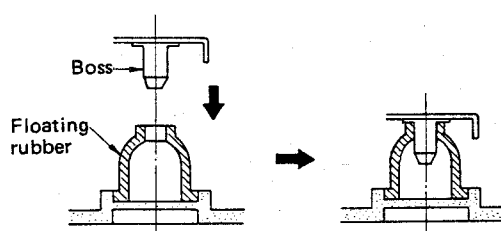
1. Remove the tray assembly.
2. Remove the two screws on the top of the front panel.
3. Remove the three screws on the bottom of the front panel.
4. Remove the LCD PC board and front PC board.

(5) Mechanism assembly removal

1. Remove the tray.
2. Remove the two screws (A), (B).

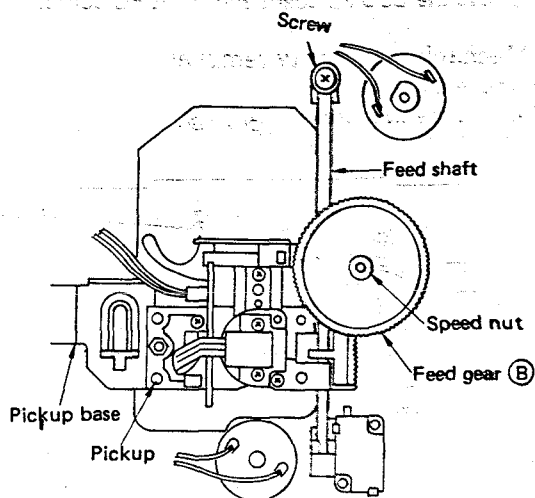


3. Disconnect the connectors.
4. Release the tab on the left side of the chassis, lift the mechanism ass'y straight up then slide it backward to remove it.
5. Make sure that the four bosses at the rear of the mechanism ass'y are correctly inserted into the floating rubbers on the chassis when the assembly is re-installed. (Confirm that the mounting bosses of screws (A) and (B) come to the centers of the holes in the chassis.) It is particularly important that the front right part is secured correctly.

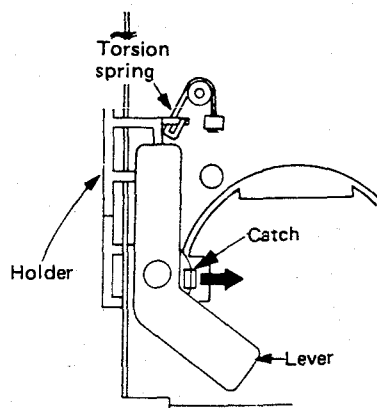


(6) Laser pickup removal

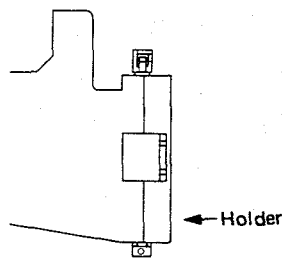
1. Remove the speed nut and remove the feed gear B.
2. Remove the feed shaft lock screw and remove the feed shaft with the pickup.
3. Remove the pickup from the pickup base.

**(7) Spindle motor removal**

1. Remove the tray assembly.
2. Remove the lever. The lever can be extracted by pulling it upward while pushing the catch (shown in the figure below) in the direction of the arrow.

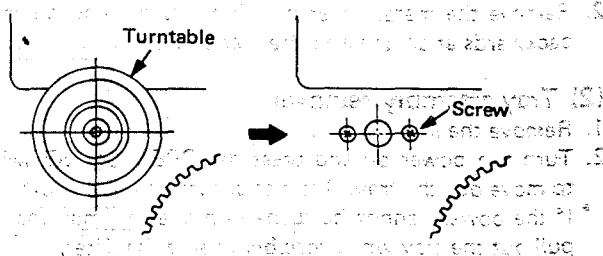


3. Remove the holder.

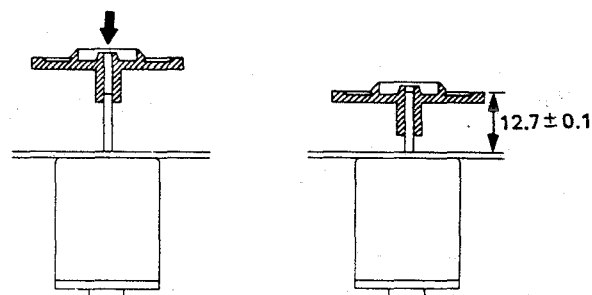


Note: After the holder has been re-installed, mount the torsion spring correctly.

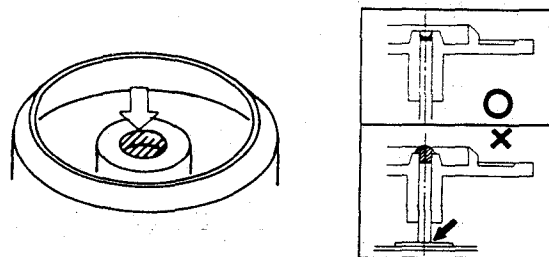
4. Remove the turntable and remove the two screws.

**Note: Installation of the spindle motor**

1. Secure the two screws applying uniform tightening torque.
2. Insert the turntable by pressing it. The turntable must be inserted straight while supporting the motor at its lowest section; alignment must be accurate to obtain a height of $12.7 \text{ mm} \pm 0.1 \text{ mm}$ above the top surface of the mechanism base.

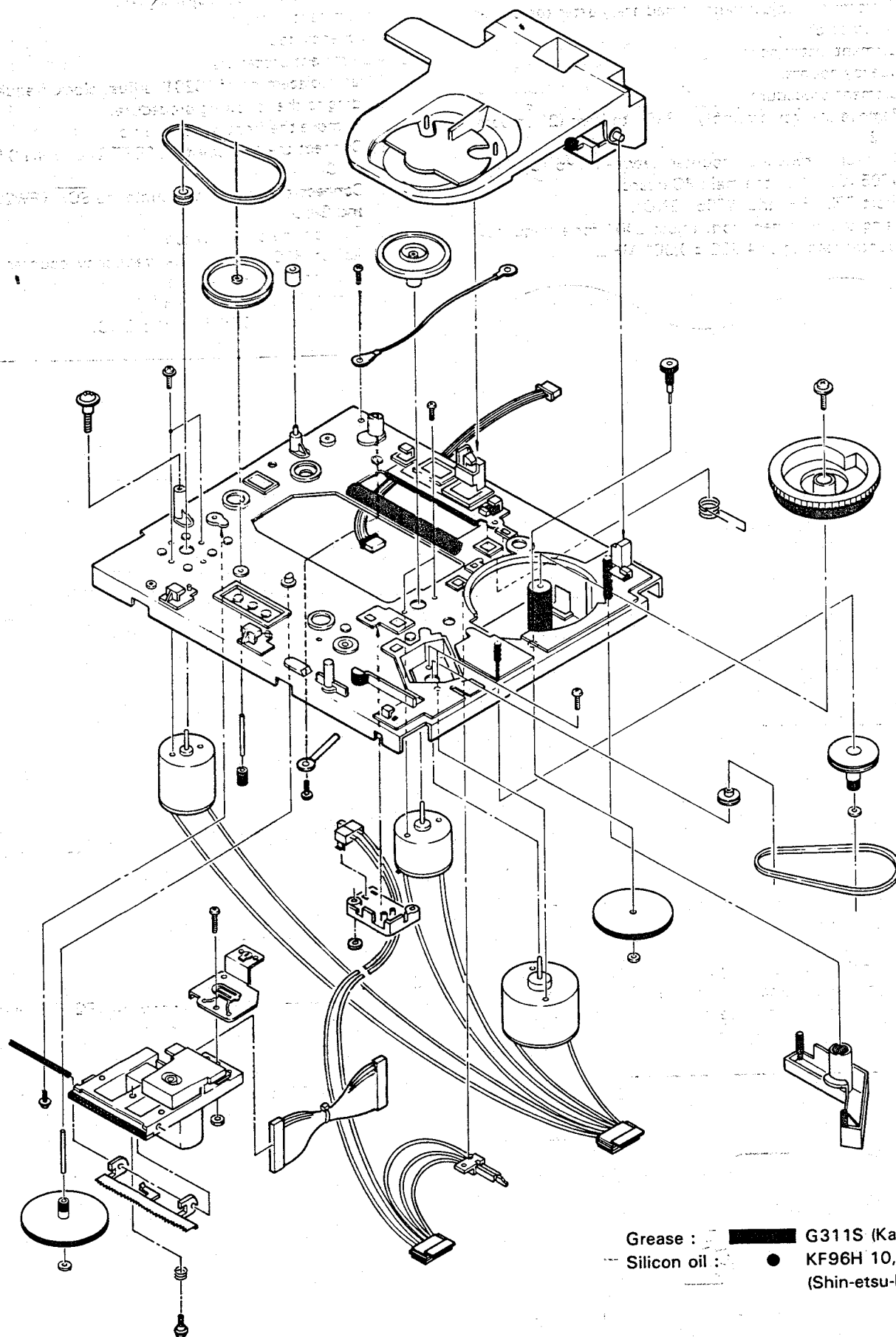


3. After pressure insertion is complete, bond the motor shaft and turntable together (at the section marked by an arrow in the figure on the left below).



Use "LOCTITE #460" bonding agent and limit the amount applied to a minimum. Take care not to allow excess bonding agent to get onto the turntable, as shown in the figure below. Be extremely careful not to allow bonding agent to adhere to the motor bearings (section marked by an arrow in the figure on the right above).

Application Points for Grease

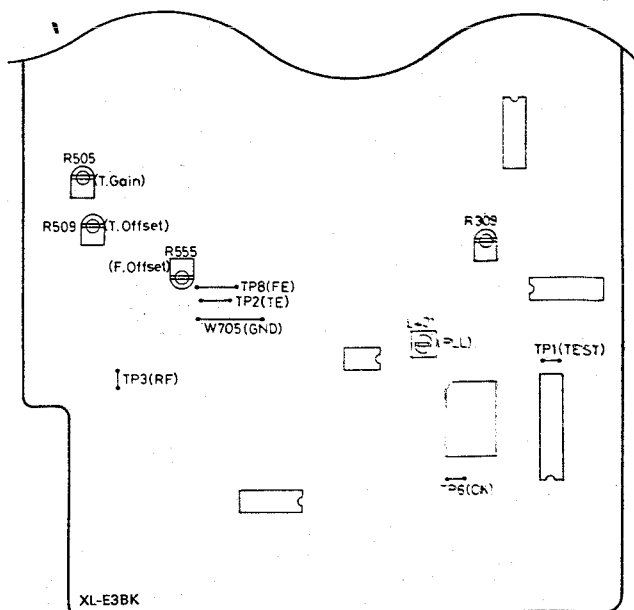


Adjustment Procedures

(1) PLL freerunning adjustment

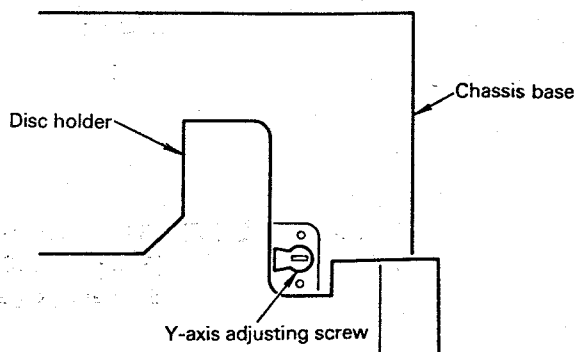
Note: Perform this adjustment immediately after the power is turned on.

1. Adjustment instrument
Frequency counter
2. Adjustment procedure
 - 1) Remove the tray assembly. (Refer to item (2) on page 1-12.)
 - 2) Connect a frequency counter between TP6 (CK) and W705 (GND) on the main PC board.
 - 3) Short TP3 (RF) and W705 (GND).
 - 4) Using the alignment rod, adjust L401 for a frequency counter reading of 4.332 ± 0.001 MHz.



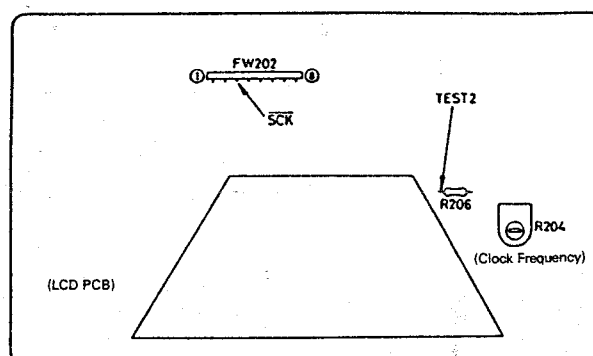
(2) Y-axis adjustment

1. Adjustment instruments
Oscilloscope, Flat-bladed screwdriver, Normal disc
2. Adjustment procedure
 - 1) Remove the tray assembly. (Refer to item (2) on page 1-12.)
 - 2) Connect an oscilloscope between TP3 (RF) and W705 (GND) on the main PC board.
 - 3) Play the disc.
 - 4) Turn the Y-axis adjusting screw located on the pickup base so that the amplitude of the RF signal (waveform on the oscilloscope) becomes maximum with the clearest possible waveform.



(3) Clock frequency adjustment

1. Adjustment instrument
Frequency counter
2. Adjustment procedure
After replacement of IC201, adjust clock frequency according to the following procedure.
 - 1) Remove the front panel assembly.
 - 2) Connect the test point 2 (TEST 2) of ENN-076-01 to GND.
 - 3) Connect the frequency counter to $\overline{SCK}$ (FW202 ③) and GND.
 - 4) Turn on the power switch.
 - 5) Adjust R204 so that the frequency counter reads a value of $200 \text{ kHz} \pm 4 \text{ kHz}$.
 - 6) Turn off the power switch.
 - 7) Disconnect TEST 2 from the GND.



(4) Focus offset adjustment

1. Adjustment instruments
Oscilloscope, Normal disc
2. Adjustment procedure
 - 1) Connect an oscilloscope between TP3 (RF) and W705 (GND) on the main PC board.
 - 2) Play the disc.
 - 3) Adjust R555 so that the amplitude of the RF signal (waveform on the oscilloscope) becomes maximum with the clearest possible waveform.

(5) Tracking gain adjustment

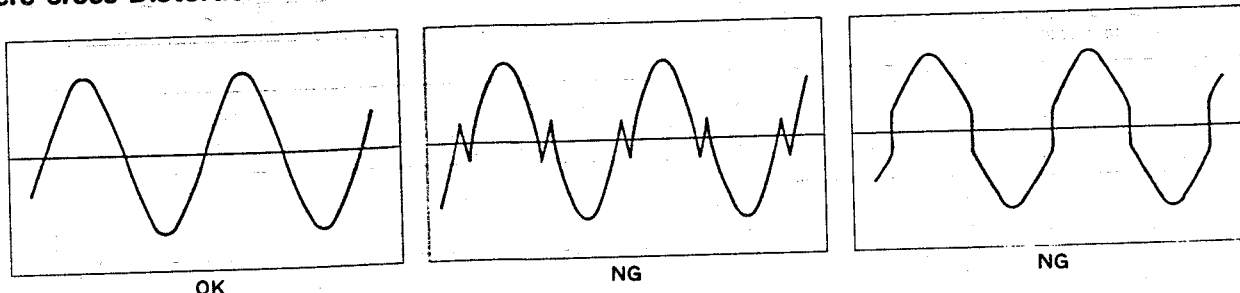
1. Adjustment instruments
Oscilloscope, Normal disc
2. Adjustment procedure
 - 1) Connect an oscilloscope between TP2 (TE) and W705 (GND) on the main PC board.
 - 2) Play the disc.
 - 3) Short TP1 (TEST) to W705 (GND).
 - 4) Adjust R505 so that the tracking error signal (waveform on the oscilloscope) is 2 Vp-p .

(6) Tracking offset adjustment

1. Adjustment instruments
Oscilloscope, Normal disc
 2. Adjustment procedure
 - 1) Connect an oscilloscope between TP2 (TE) and W705 (GND) on the main PC board.
 - 2) Play the disc.
 - 3) Short TP1 (TEST) to W705 (GND).
 - 4) Adjust R509 so that the DC level of the tracking error signal (waveform on the oscilloscope) becomes 0.
- Note: Adjust R509 so that the waveform becomes symmetrical around the 0 level.

**(7) Audio Circuit Adjustment
(Zero-cross Distortion)**

- 1) Necessary equipment
Oscilloscope, test disc (CRG1106).
- 2) Adjustment procedures
 1. Play back the ninth song (1 kHz, -60 dB) on the test disc.
 2. Adjust R309 so that the playback waveform becomes a true sinusoidal waveform.

● Zero-cross Distortion Waveform**Maintenance of Laser Pickup****(1) Service life of the laser pickup**

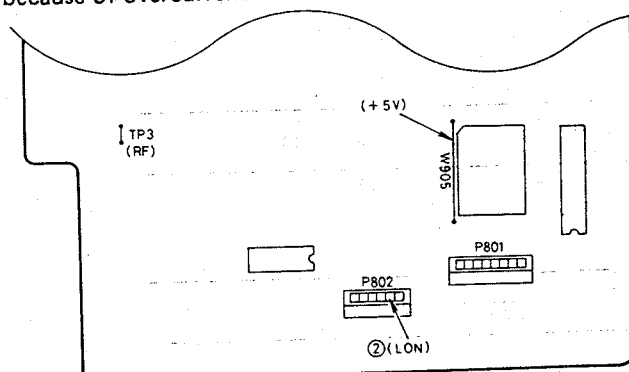
- When measuring with a laser power meter
 1. Remove the flat wires from sockets P801 and P802 on the main PC board.
 2. Connect the pin ② (LON) of P802 to +5 V line.
 3. Turn the power on and measure the power of the pickup laser.
- When a laser power meter is not available.
 1. Turn the power on and load a disc.
 2. Press the PLAY button to start playing.
 3. Connect an oscilloscope to TP3 (RF), and measure the EFM output.
- When the measured value is as shown in the table below, replace the pickup because the service life of the laser diode is judged as having expired.

Measurement value	Measurement instrument	Measured value
Laser power	Laser power meter	Less than 0.1 mW
EFM output (Amplitude of eye pattern)	Oscilloscope	Less than 1.0 V

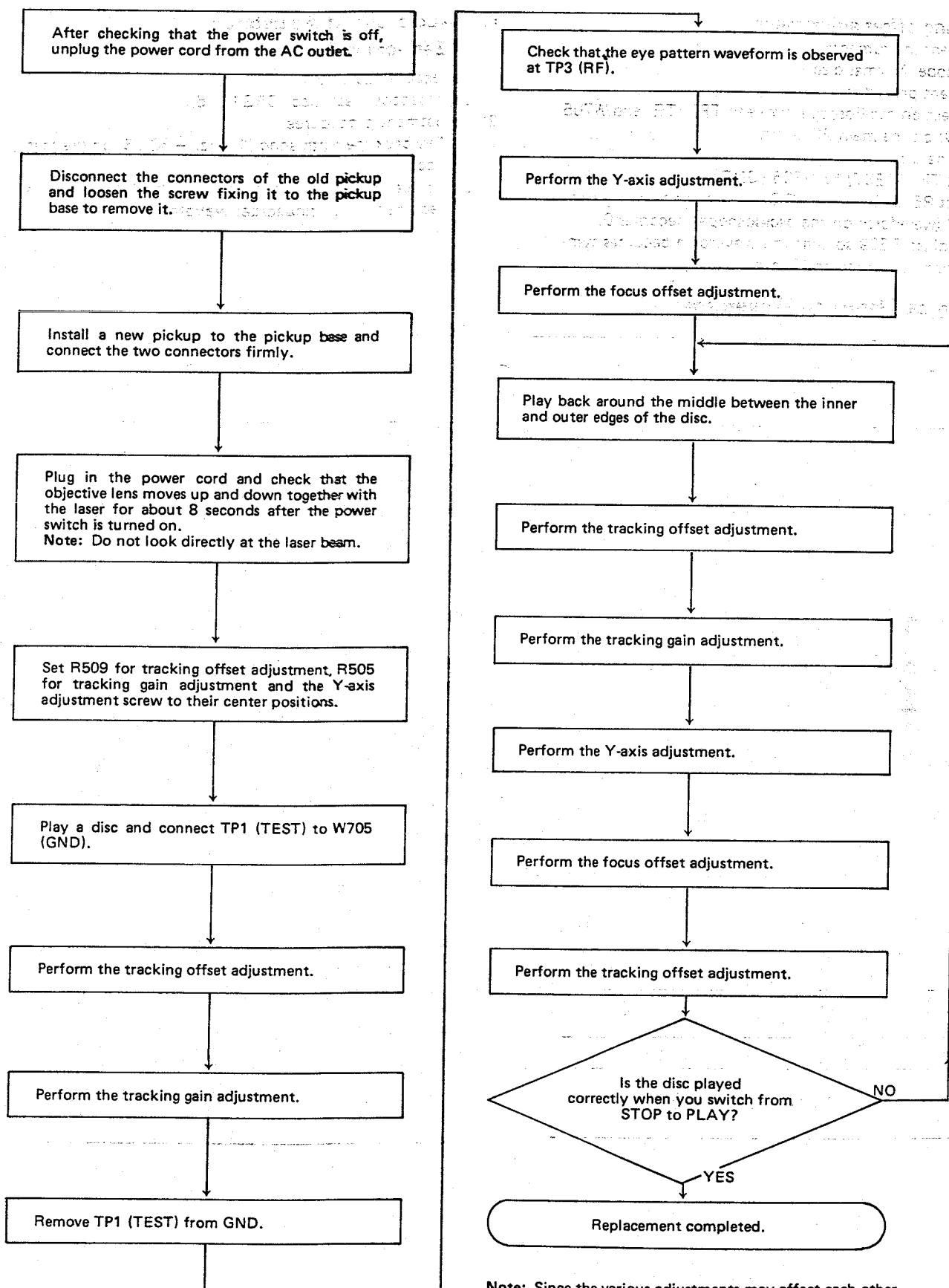
(2) Semifixed resistor on the APC board

The semifixed resistor on the APC board installed with the pickup is used to adjust the laser power. Do not touch this semifixed resistor because this adjustment should be performed as part of a pair of adjustments to match the characteristics of the optical block.

If the laser power is too low, replace the pickup since the service life of the laser diode has expired. Turning the semifixed resistor with a normal pickup may damage the pickup because of overcurrent.



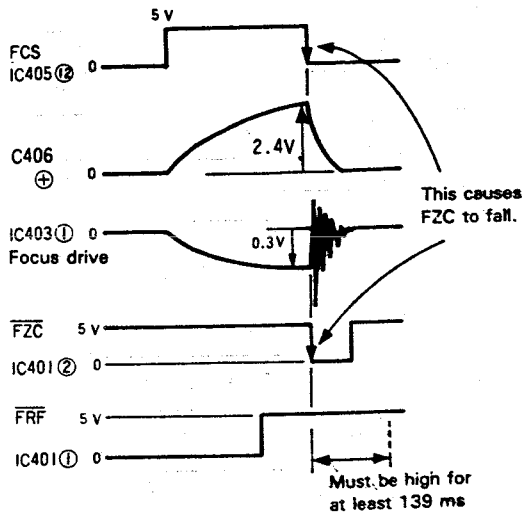
Replacement of Laser Pickup



Note: Since the various adjustments may affect each other, adjust repeatedly a few times.

Flow of Operation Until TOC is Read

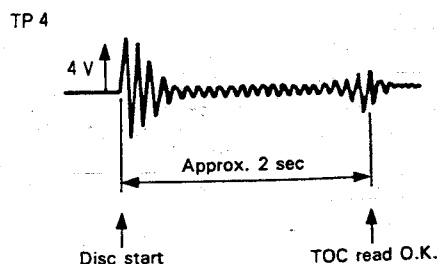
■ When focusing succeeds



■ When focusing fails

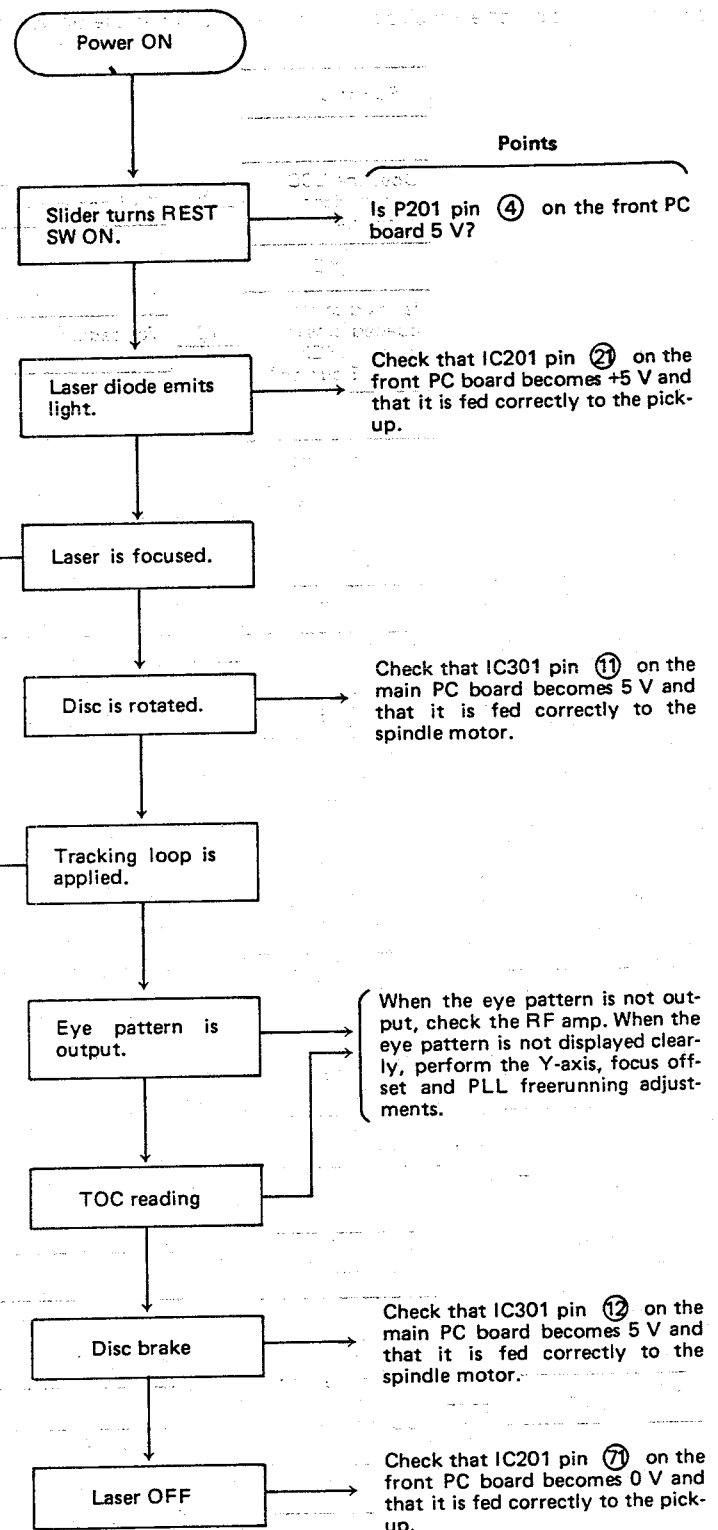
- The FZC signal is not output when the lens moves up and down at 2-second interval.
- The FRF signal is not output or the focus servo loop is abnormal when the lens moves up and down at 1-second interval.

■ When tracking succeeds



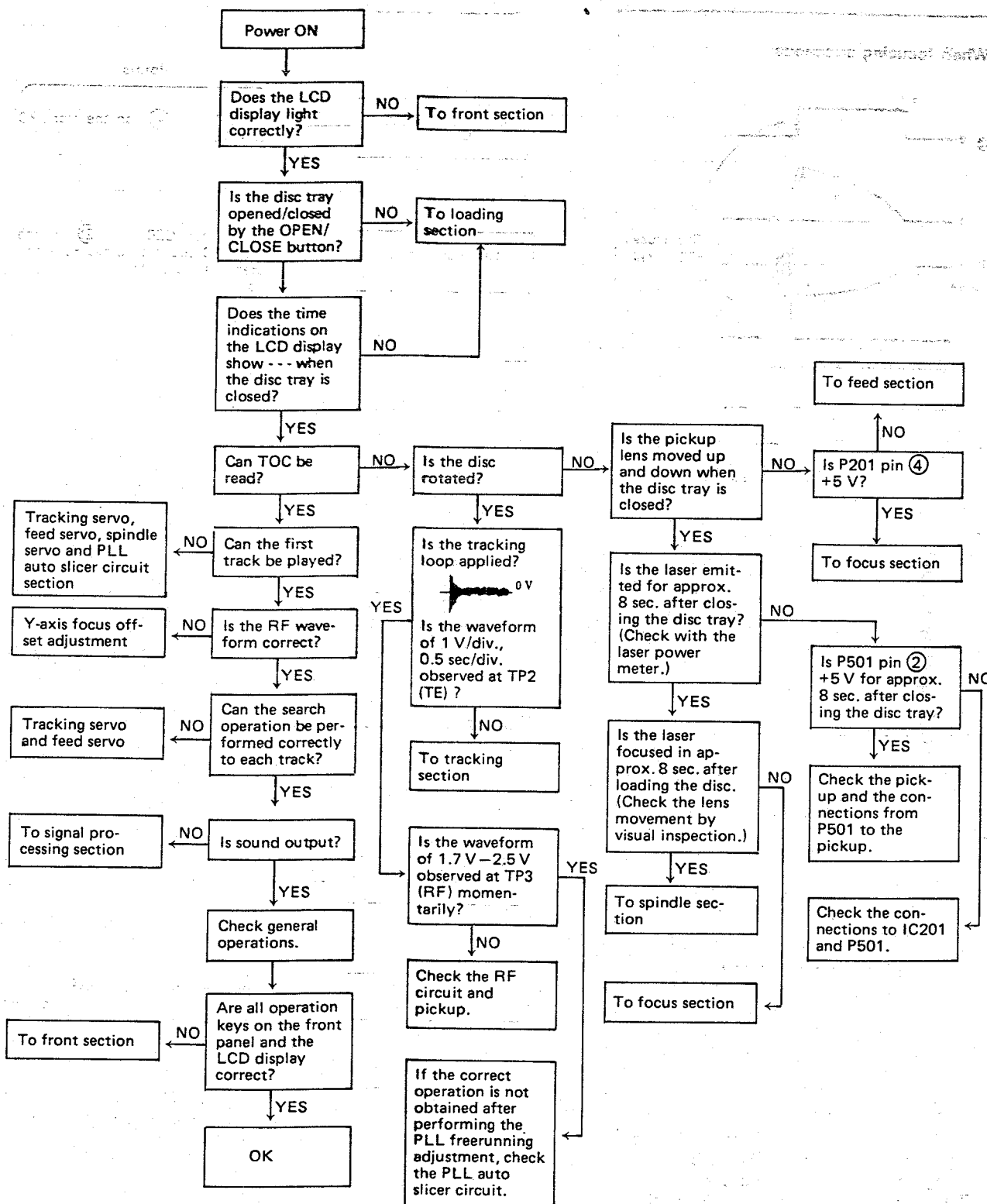
■ When tracking fails

- Tracking offset is not correctly adjusted when the waveform at TP4 does not swing up and down around 0 V.
- The tracking loop is abnormal when the normal waveform is present at TP4.

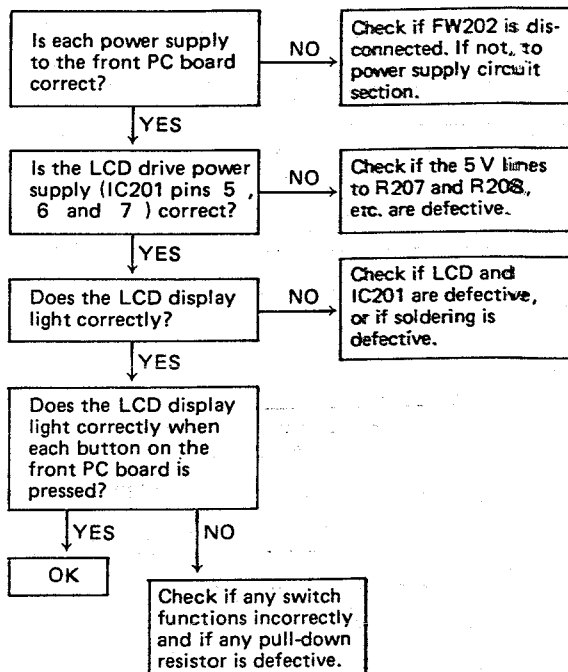


Troubleshooting

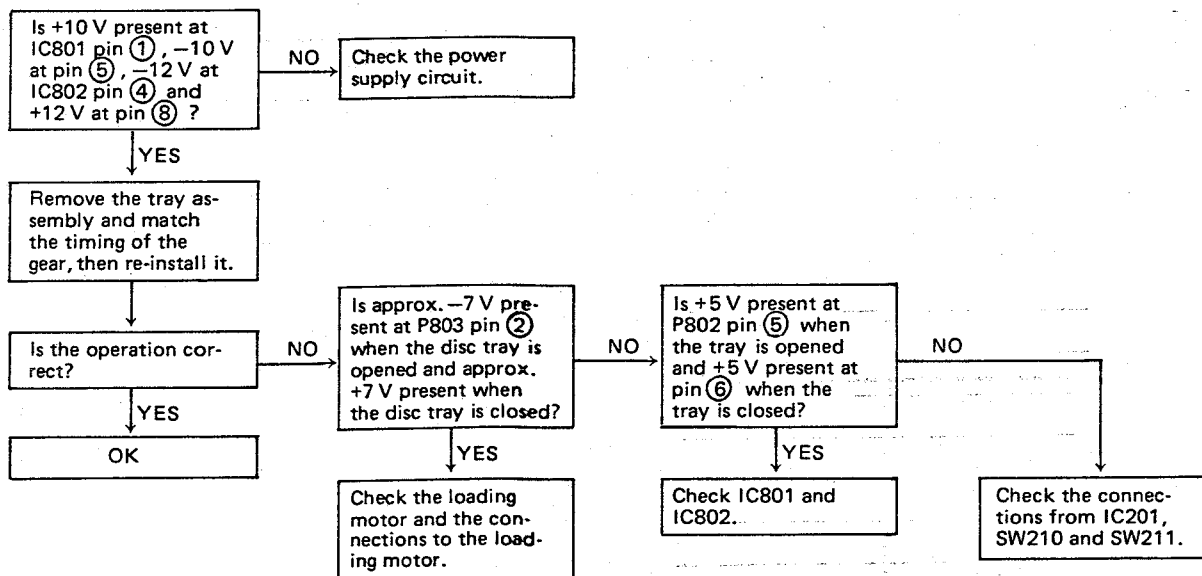
Shows the condition of each circuit from the time when the power is turned on to when play can be started.



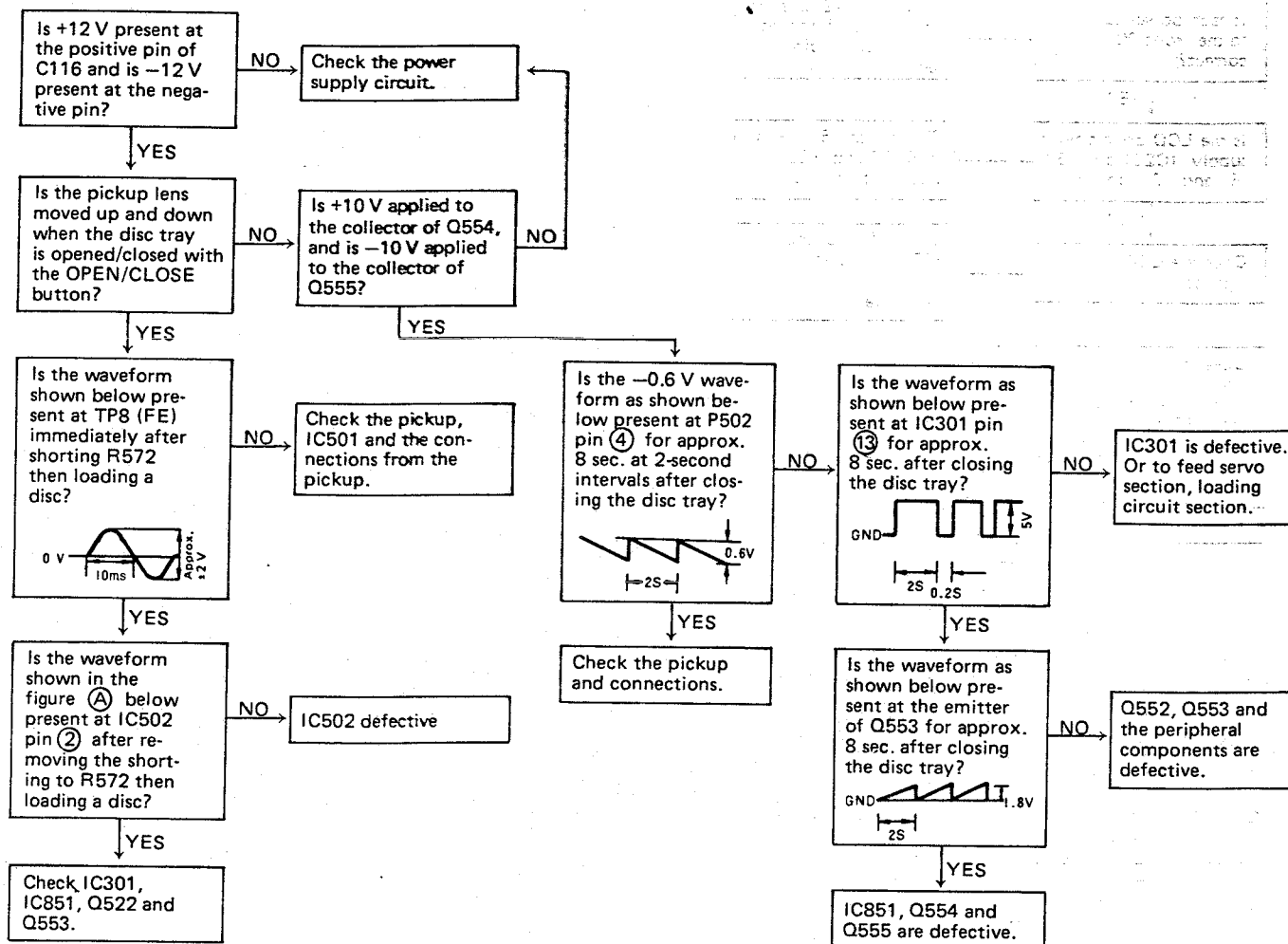
Front circuit section



Loading circuit section

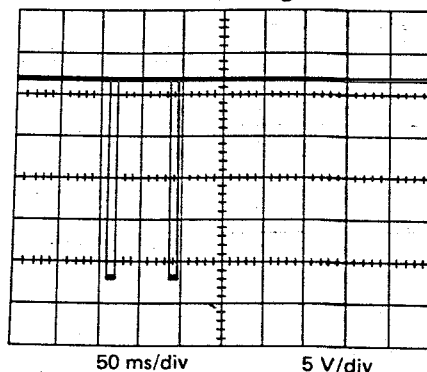


Focus servo circuit section

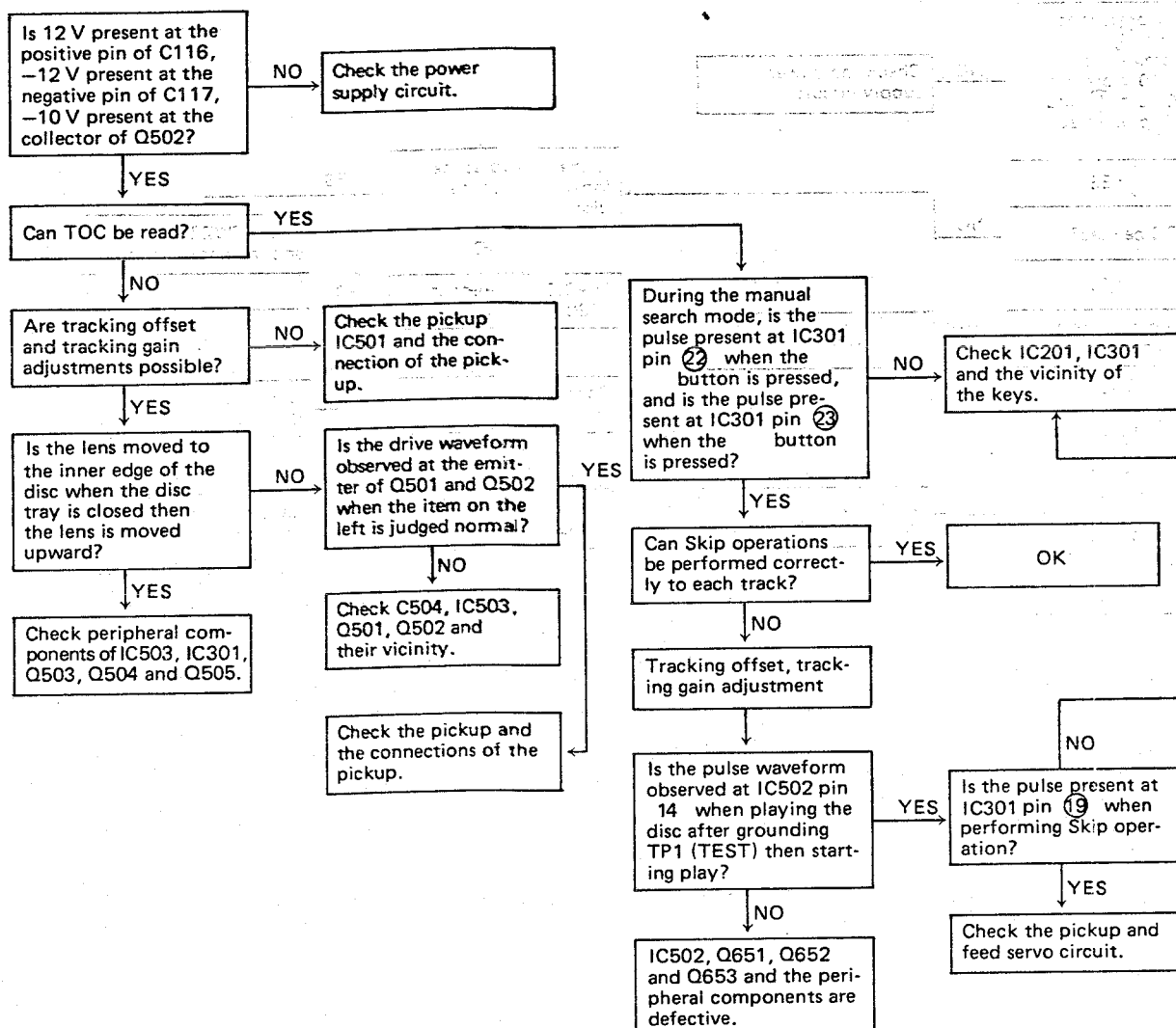


- (A) Focus zero cross waveform when the disc start playing
Focus zero cross signal just before starting play: the width of the pulse is approx. 10 msec.

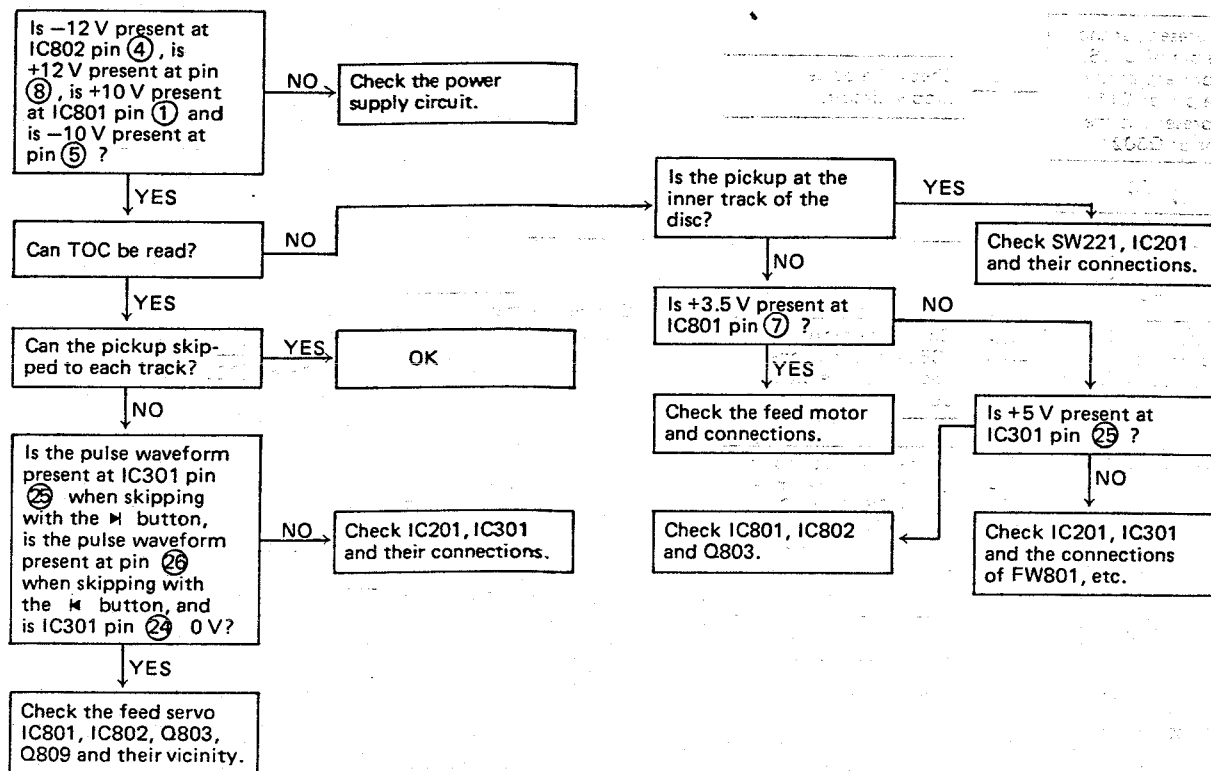
Pin (2)



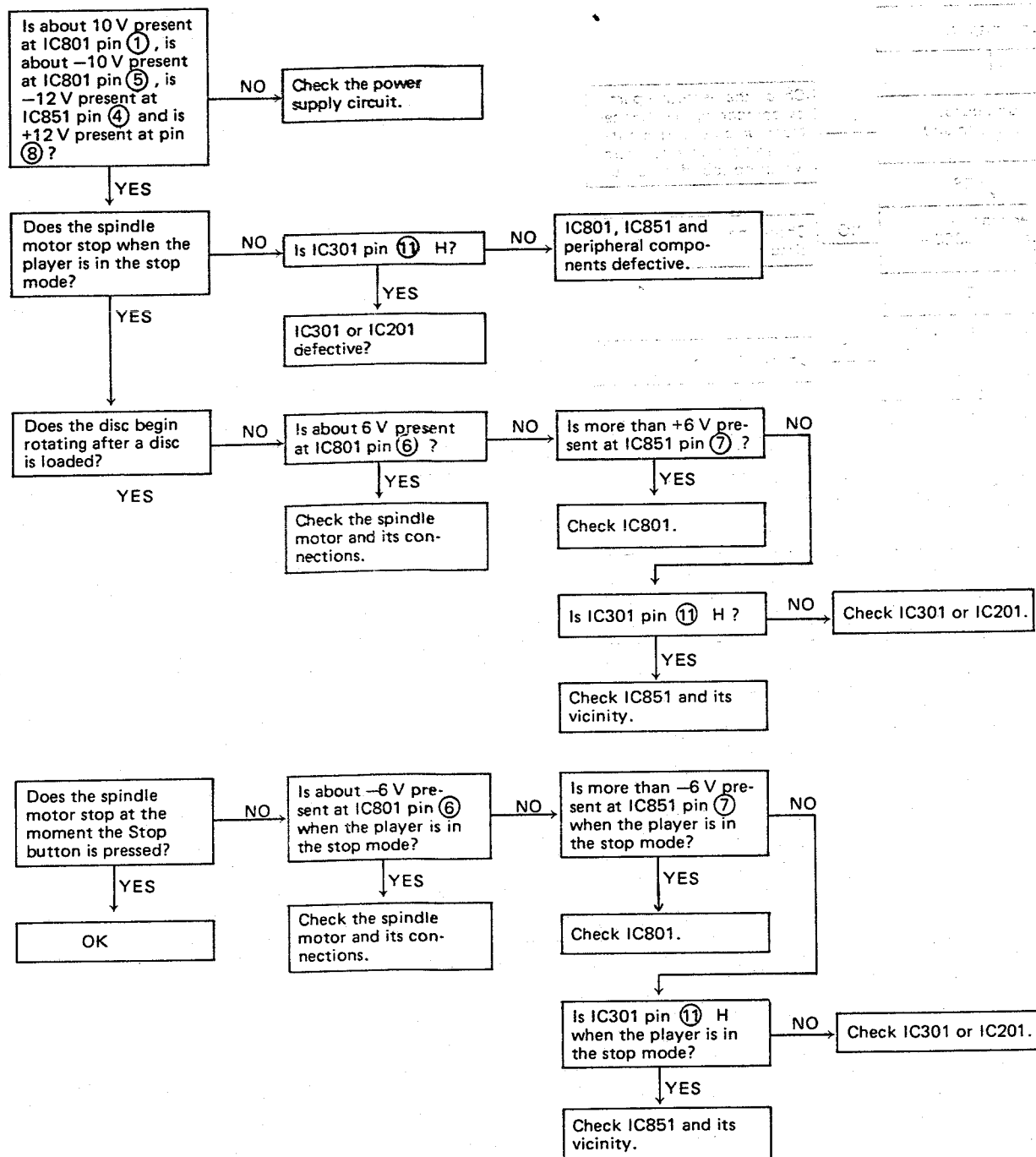
Tracking servo circuit section



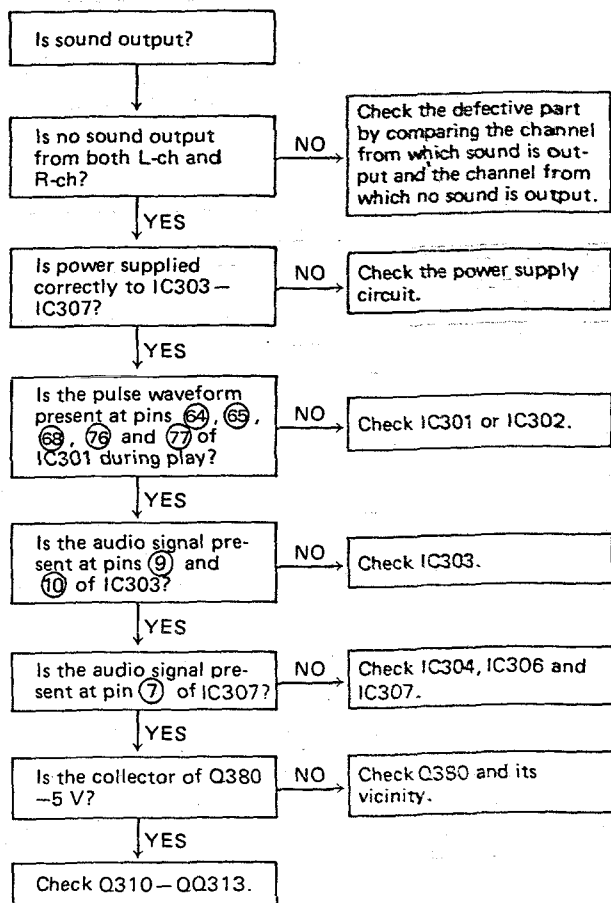
Feed servo circuit section



Spindle servo circuit section



Signal processing circuit section



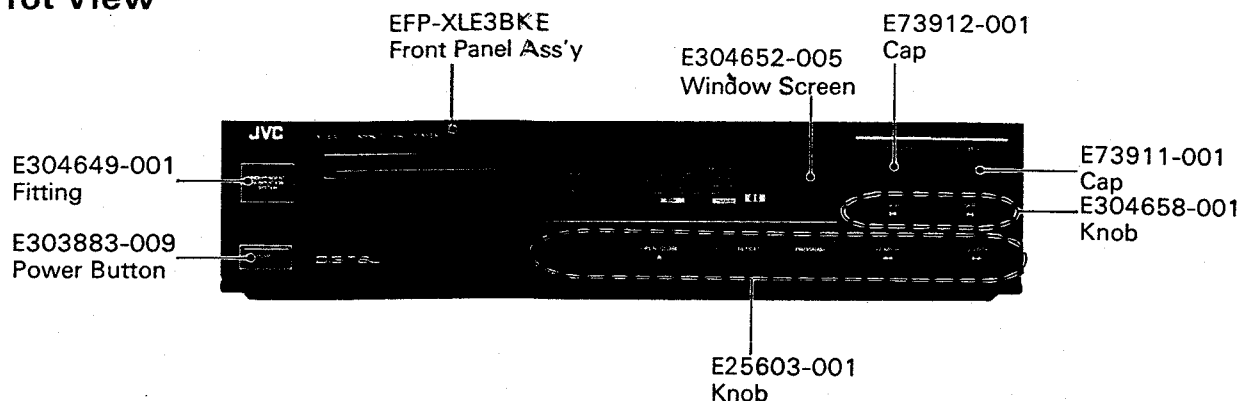
PARTS LIST

Contents

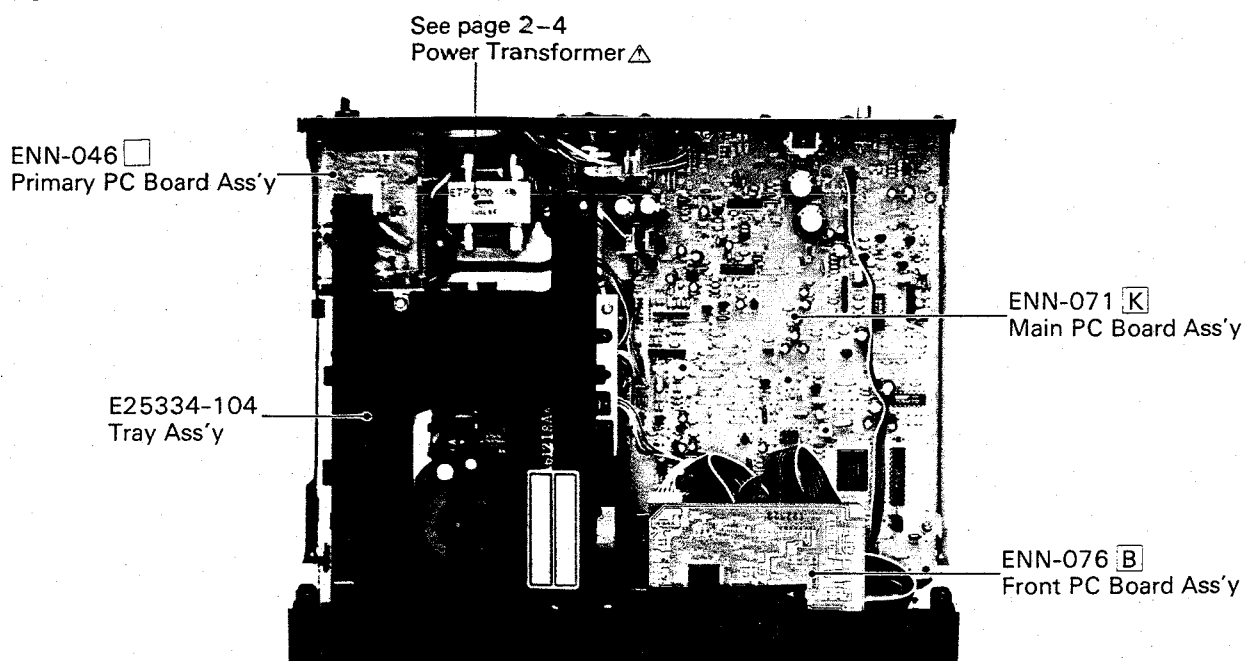
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Main Parts Location

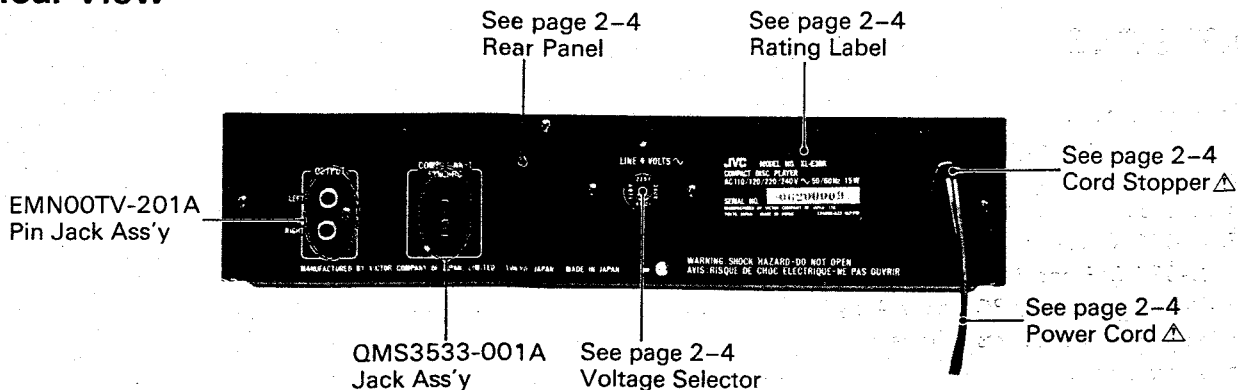
■ Front View



■ Top View

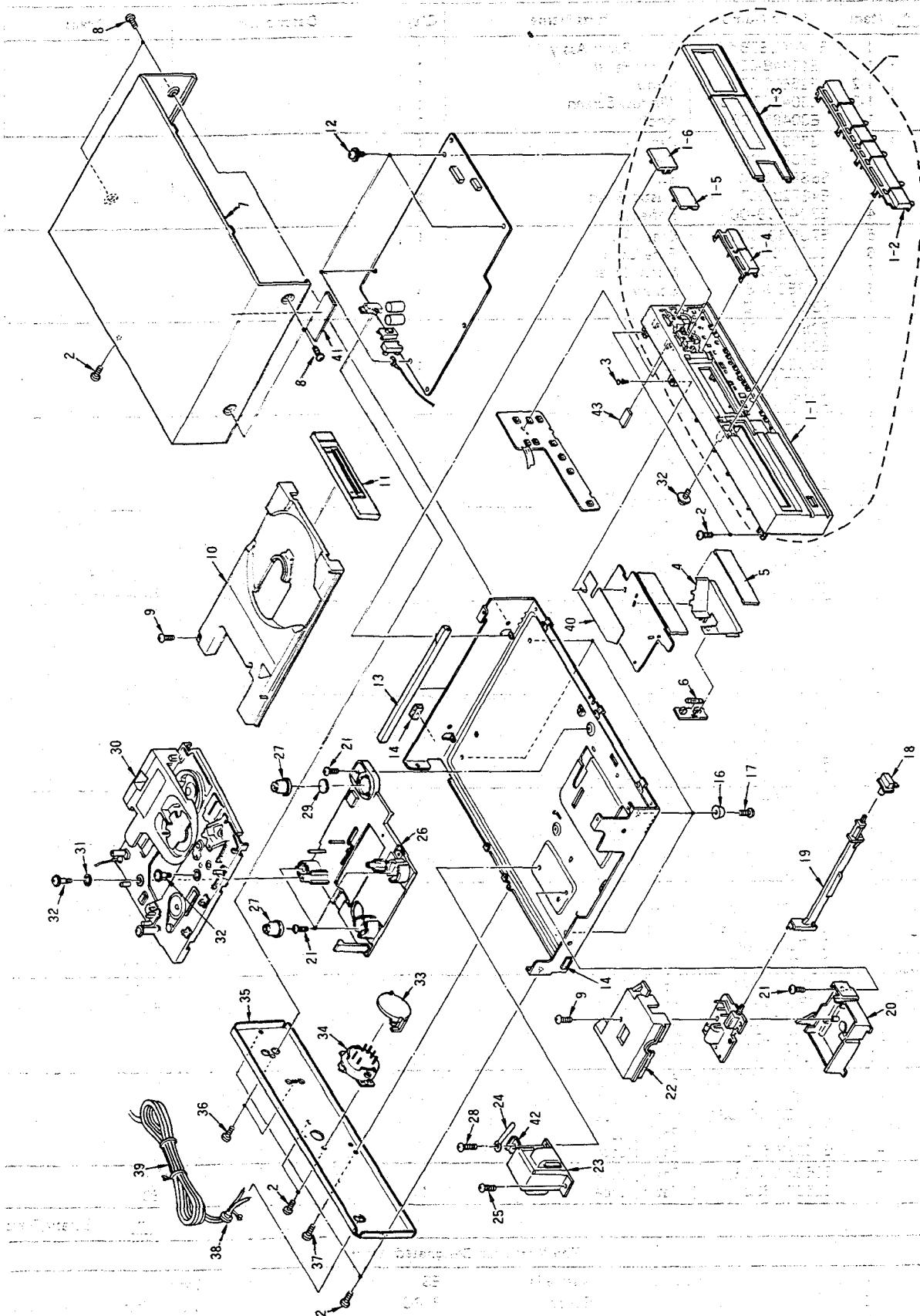


■ Rear View



Δ : Safety Parts

Exploded View and Parts List



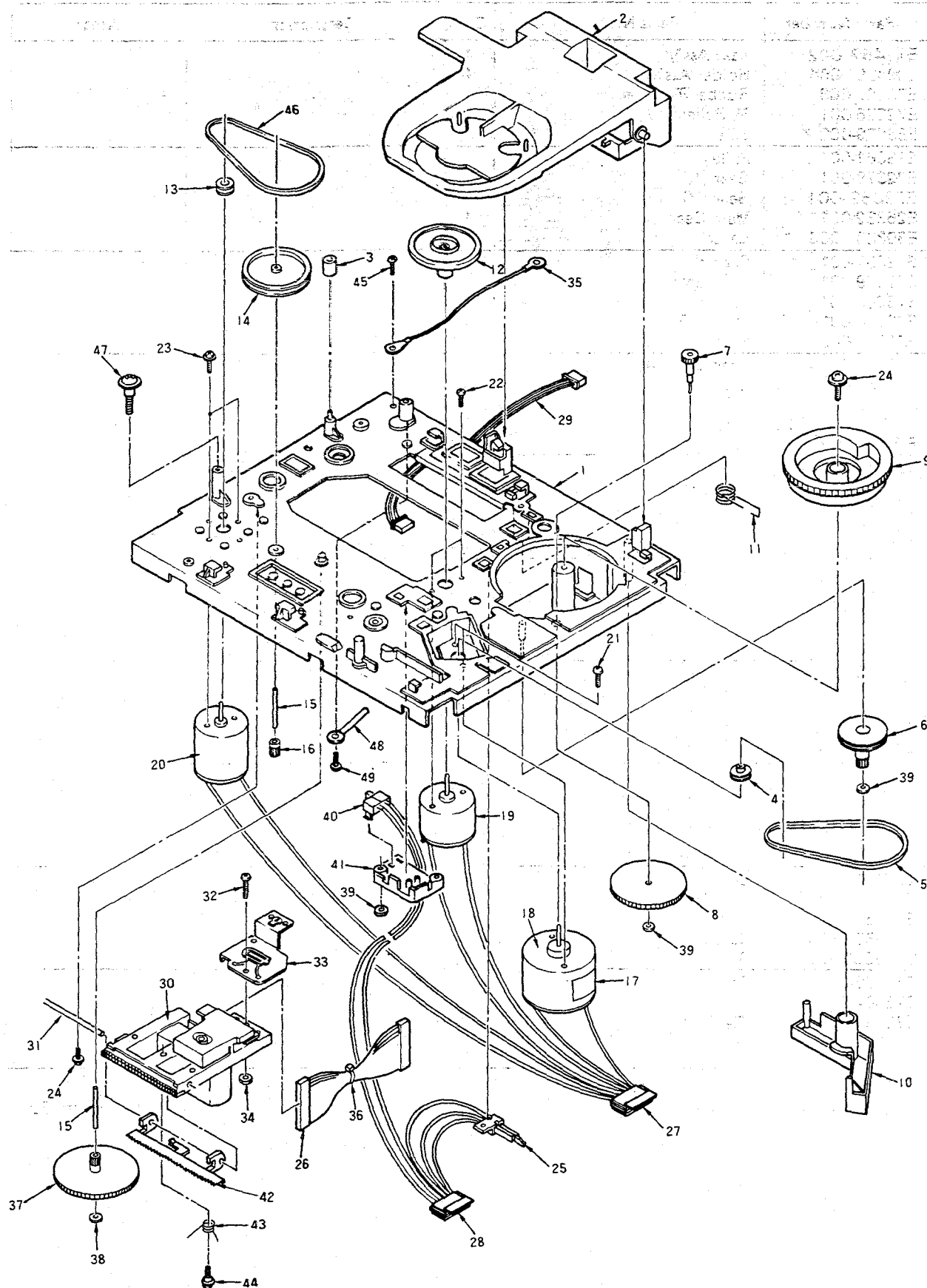
Exploded View and Parts List

Item	Parts Number	Parts Name	Q'ty	Description	Areas
1	EFP-XLE3BKE	Front Panel Ass'y	1		
1-1	E11448-001	Front Panel	1		
1-2	E25603-001	Knob	1		
1-3	E304652-005	Window Screen	1		
1-4	E304658-001	Knob	1		
1-5	E73912-001	Cap	1		
1-6	E73911-001	Cap	1		
2	SBSE3008M	Screw	7		
3	E48729-007	Plastic Rivet	2		
4	E304659-001	Reflector	1		
5	E73963-002	Sheet Ass'y	1		
6	ELP4101-003	Fuse Lamp	1		
7	E25107-006	Metal Cover	1		
8	SDSE3008M	Screw	4		
9	SBSF3014Z	Screw	2		
10	E25334-104	Tray Ass'y	1		
11	E304649-001	Fitting	1		
12	GBSE3008CC	Screw	4		
13	E65778-009	Spacer	1		
14	E72572-005	Spacer	2		
15	E11447-001	Chassis Base	1		
16	E47227-026	Foot	4		
17	SDSE3006M	Screw	4		
18	E303883-009	Power Button	1		
19	E304208-005	Push Shaft	1		
20	E25530-002	Case	1		
21	SBSE3008CC	Screw	5		
22	E304207-003	Cover	1		
23	ETP1020-18EA	Power Transformer	1		E, A, G, ES
23	ETP1020-18MA	Power Transformer	1		P, PG, U
24	ETP1020-18EABS	Power Transformer	1		BS
25	E72018-001	Wire Clamp	1		
26	E65389-004	Screw	1		
27	E11402-005	Stand	1		
27	E72393-001	FL. Rubber	4		
28	E65389-006	Screw	1		
29	E74039-002	Spacer	1		
30		Mechanism Base Ass'y	1	See page 2-5	
31	E73322-001	Spacer	1		
32	E65923-003	Screw	3		
33	E302764-001	Cover	1		
34	QSR0085-008U	Voltage Selector	1		
35	E25108-015	Rear Panel	1		E, A, G, ES, BS
36	E25108-016	Rear Panel	1		P, PG, U
36	SBSF3008M	Screw	2		
37	E73562-002	Screw	1		
38	QHS3876-162	Cord Stopper	1		Except BS
39	QHS3876-162BS	Cord Stopper	1		BS
39	QMP2560-244	Power Cord	1		A
39	QMP3900-200	Power Cord	1		E, ES, G
40	QMP7600-200	Power Cord	1		P, PG, U
40	QMP9017-008BS	Power Cord	1		BS
41	E74037-001	Spacer	1		
42	E73384-004	Spacer	1		
42	E72606-001	Bracket	1		
43	EXO020010R30S	Pacer	1		
-	E24953-060	Rating Label	1		A
-	E24953-060BS	Rating Label	1		BS
-	E25096-332	Rating Label	1		P, PG, U
-	E25096-532	Rating Label	1		E
-	E25096-532F	Rating Label	1		G
-	E25096-632	Rating Label	1		ES

 : Safety Parts

The Marks for Designated Areas			
A	 Australia	ES	 Spain
E	 Europe	P, PG	 U.S. Military Market
G	 West Germany	U	 Other Countries
BS	 U.K.	No Mark indicates all areas.	

Mechanism Assembly



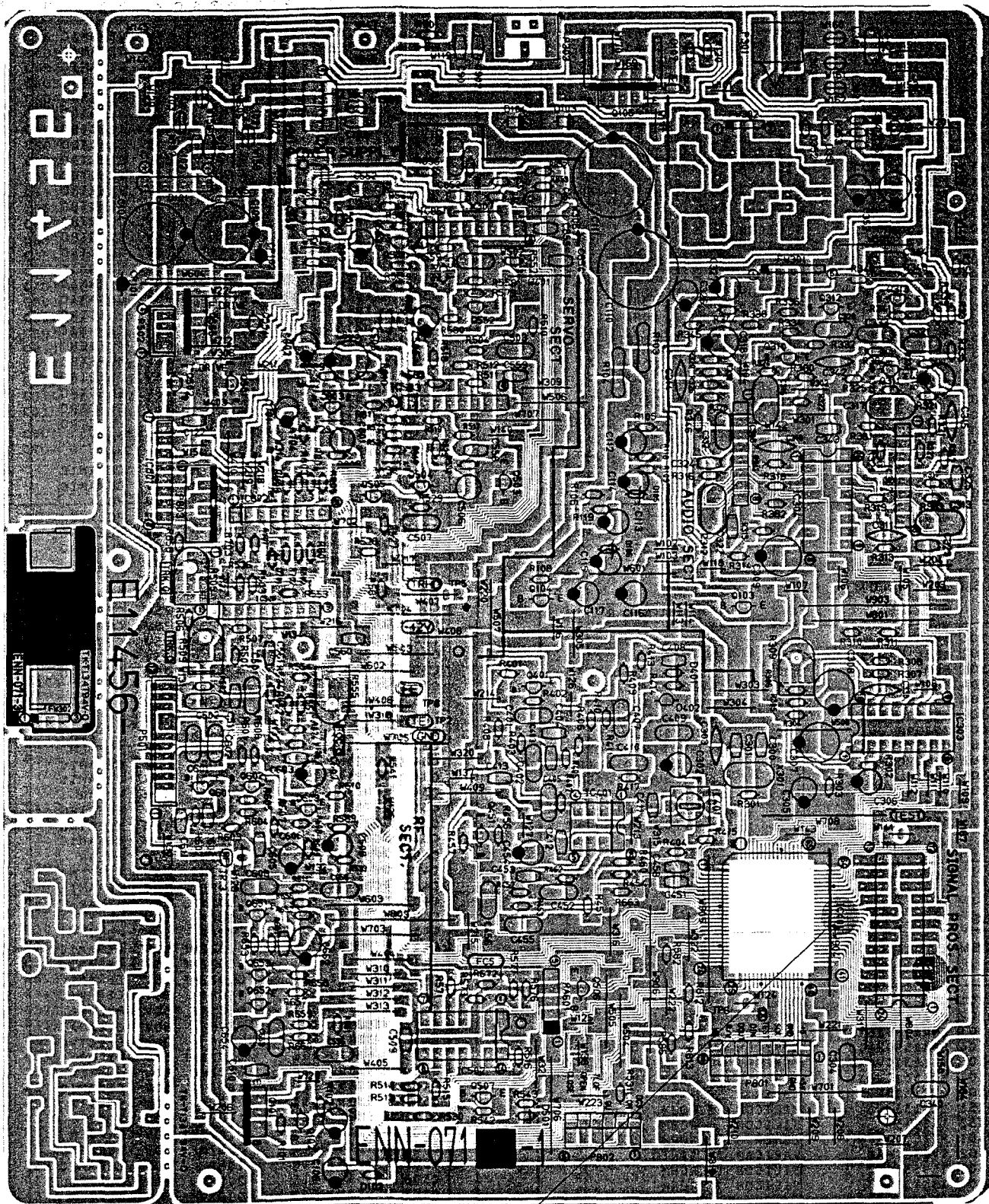
Mechanism Assembly Parts List

	Item	Parts Number	Parts Name	Q'ty	Description	Areas
	1	E11457-002	Base Ass'y	1		
	2	E304201-004	Holder Ass'y	1		
	3	E70267-003	Rubber Tube	1		
	4	E72376-001	M. Pulley	1		
	5	E69879-002	Belt	1		
	6	E73061-001	Pulley	1		
	7	E72378-001	Gear (X)	1		
	8	E73062-001	Gear (Y)	1		
	9	E25332-001	Main Gear	1		
	10	E303831-003	Lever	1		
	11	E72382-001	Spring	1		
	12	E72379-001	Turntable	1		
	13	E73060-001	Pulley	1		
	14	E73063-001	Pulley (F)	1		
	15	E71731-002	Shaft	2		
	16	E73064-002	Feed Gear (A)	1		
	17	E71967-002	Label	1		
	18	E71569-001	Motor	1		
	19	RF-310T-10470	Motor	1		
	20	RF-260T-08450	Motor	1		
	21	SDSP2604N	Screw	2		
	22	E72963-203	W. H. Screw	2		
	23	E72963-268	W. H. Screw	2		
	24	E65923-004	T. Screw	2		
	25	ESB1200-003	Leaf Switch	1		
	26	EWS25C-B103	SKT Wire Ass'y	1		
	27	EWS016-094	SKT Wire Ass'y	1		
	28	EWS015-132	SKT Wire Ass'y	1		
	29	EWS254-B106	SKT Wire Ass'y	1		
	30	OPTIMA-2	Pickup Ass'y	1		
	31	E73066-001	Feed Shaft	1		
	32	SPSP2608Z	Screw	1		
	33	E304203-002	Picup Base Ass'y	1		
	34	NNS2600Z	Nut	1		
	35	EWT021-026	SKT Wire Ass'y	1		
	36	E33754-001	Tie Band	3		
	37	E73700-001	Feed Gear	1		
	38	E72024-001	Speed Nut	1		
	39	E60912-001	Speed Nut	3		
	40	QSP2K11-E01	Push Switch	1		
	41	E304613-001	Switch Cover	1		
	42	E304196-002	Sub Rack G	1		
	43	E73851-001	Spring	1		
	44	E73035-002	Screw	1		
	45	SBSE3008CC	Screw	1		
	46	E69879-003	Belt	1		
	47	E72404-002	Screw	1		
	48	E33754-008	Tie Band	1		
	49	SBSF3010Z	Screw	1		

 : Safety Parts

Printed Circuit Board Assembly and Parts List

■ ENN-071 K Main PC Board Ass'y



*Silk-screen printed item no. (IC401) should read IC301.

*Silk-screen printed item no. (IC301) should read IC302.

Transistors

ITEM	PART NUMBER	DESCRIPTION	AREA
			MAKER
Q101	2SB507V(D,E)	SILICON	SANYO
Q102	2SC1740(R,S)	SILICON	ROHM
Q103	2SC2060(Q,R)	SILICON	ROHM
Q104	2SA934(Q,R)	SILICON	ROHM
Q105	2SD1505(E,F)	SILICON	ROHM
Q310	2SD1302(S,T)	SILICON	MATSUSHITA
Q311	2SD1302(S,T)	SILICON	MATSUSHITA
Q312	2SD1302(S,T)	SILICON	MATSUSHITA
Q313	2SD1302(S,T)	SILICON	MATSUSHITA
Q380	2SA933(R,S)	SILICON	ROHM
Q401	2SD1302(S,T)	SILICON	MATSUSHITA
Q451	2SD1302(S,T)	SILICON	MATSUSHITA
Q501	2SD400MP(E,F)	SILICON	SANYO
Q502	2SB544MP(E,F)	SILICON	SANYO
Q503	2SD1302(S,T)	SILICON	MATSUSHITA
Q504	2SD1302(S,T)	SILICON	MATSUSHITA
Q505	2SD1302(S,T)	SILICON	MATSUSHITA
Q506	2SA933(R,S)	SILICON	ROHM
Q507	2SC1740(R,S)	SILICON	ROHM
Q552	2SD1302(S,T)	SILICON	MATSUSHITA
Q553	2SA933(R,S)	SILICON	ROHM
Q554	2SD400MP(E,F)	SILICON	SANYO
Q555	2SB507V(D,E)	SILICON	SANYO
Q601	2SC535(B,C)	SILICON	HITACHI
Q602	2SC458(C,D)	SILICON	HITACHI
Q603	2SA1029(C,D)	SILICON	HITACHI
Q651	2SA1029(C,D)	SILICON	HITACHI
Q652	2SC458(C,D)	SILICON	HITACHI
Q653	2SC458(C,D)	SILICON	HITACHI
Q803	2SD1302(S,T)	SILICON	MATSUSHITA

△ : SAFETY PARTS

ICs

△	ITEM	PART NUMBER	DESCRIPTION		AREA
				MAKER	
	IC301	YM3815	I.C.		
	IC302	MB8416A-15L-SK	I.C.		
	IC303	PCMS6P	I.C.		
	IC304	BU4053B	I.C.	ROHM	
	IC306	M5218L	I.C.	MITSUBISHI	
	IC307	M5218L	I.C.	MITSUBISHI	
	IC401	M5209P	I.C.	MITSUBISHI	
	IC501	NJM072S	I.C.		
	IC502	NJM2901N	I.C.		
	IC503	M5218L	I.C.	MITSUBISHI	
	IC801	STA341M	I.C.		
	IC802	M5218L	I.C.	MITSUBISHI	
	IC851	M5218L	I.C.	MITSUBISHI	

△ : SAFETY PARTS

Diodes

△	ITEM	PART NUMBER	DESCRIPTION		AREA
				MAKER	
	D101	S1VB20F	SILICON		
	D102	MT25.6JC	ZENER	ROHM	
	D103	ERA15-02L19	SILICON		
	D104	ERA15-02L19	SILICON		
	D105	MT213JC	ZENER	ROHM	
	D106	MT213JC	ZENER	ROHM	
	D107	MT213JB	ZENER		
	D351	1SS133	SILICON	ROHM	
	D352	1SS133	SILICON	ROHM	
	D401	MT25.1JB	ZENER	ROHM	
	D402	SVC321-AW	VARICAP	SANYO	
	D501	1SS133	SILICON	ROHM	
	D701	1SS133	SILICON	ROHM	

△ : SAFETY PARTS

Capacitors

ITEM	PART NUMBER	DESCRIPTION	AREA
C101	QCHB1EZ-223	0.022MF 25V	CERAMIC
C102	QCHB1EZ-223	0.022MF 25V	CERAMIC
C103	QCHB1EZ-223	0.022MF 25V	CERAMIC
C104	QETB1CM-228	2200MF 16V	ELECTRO
C105	QETB1CM-228	2200MF 16V	ELECTRO
C106	QEK50JM-476	47MF 6.3V	ELECTRO
C107	QEK50JM-476	47MF 6.3V	ELECTRO
C110	QETB1EM-228	2200MF 25V	ELECTRO
C111	QETB1EM-228	2200MF 25V	ELECTRO
C112	QETB1CM-476	47MF 16V	ELECTRO
C113	QETB1CM-476	47MF 16V	ELECTRO
C114	QETB1CM-476	47MF 16V	ELECTRO
C115	QETB1CM-476	47MF 16V	ELECTRO
C116	QETB1CM-476	47MF 16V	ELECTRO
C117	QETB1CM-476	47MF 16V	ELECTRO
C122	QCHB1EZ-223	0.022MF 25V	CERAMIC
C300	QCSB1HJ-100	10PF 50V	CERAMIC
C301	QCSB1HJ-100	10PF 50V	CERAMIC
C302	QETB1AM-107	100MF 10V	ELECTRO
C303	QCHB1EZ-223	0.022MF 25V	CERAMIC
C304	QFV81HJ-224	0.22MF 50V	T.FILM
C305	QETB1CM-476	47MF 16V	ELECTRO
C306	QETB1CM-476	47MF 16V	ELECTRO
C307	QETB1CM-227	220MF 16V	ELECTRO
C308	QETB1CM-227	220MF 16V	ELECTRO
C309	QETB1CM-227	220MF 16V	ELECTRO
C312	QFP81HG-241	240PF 50V	POLY
C313	QFP81HG-241	240PF 50V	POLY
C314	QCF21HP-473	0.047MF 50V	CERAMIC
C315	QCF21HP-473	0.047MF 50V	CERAMIC
C316	QFP81HJ-271	270PF 50V	POLY
C317	QFP81HJ-271	270PF 50V	POLY
C318	QETB1HM-476	47MF 50V	ELECTRO
C319	QETB1HM-476	47MF 50V	ELECTRO
C320	QFN81HK-822	8200PF 50V	MYLAR
C321	QFN81HK-822	8200PF 50V	MYLAR
C322	QCHB1EZ-223	0.022MF 25V	CERAMIC
C323	QCHB1EZ-223	0.022MF 25V	CERAMIC
C324	QCHB1EZ-223	0.022MF 25V	CERAMIC
C325	QCHB1EZ-223	0.022MF 25V	CERAMIC
C326	QETB1EM-226	22MF 25V	ELECTRO
C327	QETB1EM-226	22MF 25V	ELECTRO
C330	QFN81HJ-103	0.01MF 50V	MYLAR
C332	QFN81HK-562	5600PF 50V	MYLAR
C333	QFN81HK-562	5600PF 50V	MYLAR
C340	QFV81HJ-683	0.068MF 50V	T.FILM
C341	QFV81HJ-683	0.068MF 50V	T.FILM
C342	QCF21HP-102	1000PF 50V	CERAMIC
C343	QCHB1EZ-223	0.022MF 25V	CERAMIC
C344	QFN81HJ-103	0.01MF 50V	MYLAR
C352	QETB1EM-106	10MF 25V	ELECTRO
C353	QETB1CM-107	100MF 16V	ELECTRO
C360	QCS21HJ-560	56PF 50V	CERAMIC
C401	QFN81HJ-103	0.01MF 50V	MYLAR
C402	QFV81HJ-224	0.22MF 50V	T.FILM
C403	QCB81HK-681	680PF 50V	CERAMIC
C407	QFN81HJ-103	0.01MF 50V	MYLAR
C409	QFP81HJ-151	150PF 50V	POLY
C410	QFP81HJ-471	470PF 50V	POLY
C411	QCHB1EZ-223	0.022MF 25V	CERAMIC
C412	QCHB1EZ-223	0.022MF 25V	CERAMIC
C413	QCHB1EZ-223	0.022MF 25V	CERAMIC
C451	QCB81HK-151	150PF 50V	CERAMIC
C452	QFN81HJ-103	0.01MF 50V	MYLAR
C453	QCB81HK-271	270PF 50V	C.CAPA.
C454	QETB1EM-106	10MF 25V	ELECTRO
C455	QFN81HJ-183	0.018MF 50V	MYLAR
C456	QFV81HJ-224	0.22MF 50V	T.FILM
C458	QCSB1HJ-180	18PF 50V	CERAMIC
C501	QFP81HJ-151	150PF 50V	POLY
C502	QFP81HJ-121	120PF 50V	POLY
C503	QFV81HJ-273	0.027MF 50V	T.FILM
C504	QETB1HM-474	0.47MF 50V	ELECTRO
C505	QCSB1HJ-100	10PF 50V	CERAMIC
C506	QEN51HM-225	2.2MF 50V	NON POLE
C507	QFV81HJ-393	0.039MF 50V	T.FILM
C508	QETB1CM-476	47MF 16V	ELECTRO
C509	QCHB1EZ-223	0.022MF 25V	CERAMIC
C551	QFN81HJ-183	0.018MF 50V	MYLAR
C552	QCB81HK-561	560PF 50V	CERAMIC
C553	QFV81HJ-563	0.056MF 50V	T.FILM
C555	QETB1CM-226	22MF 16V	ELECTRO
C556	QFV81HJ-104	0.1MF 50V	T.FILM
C558	QCHB1EZ-223	0.022MF 25V	CERAMIC
C559	QCHB1EZ-223	0.022MF 25V	CERAMIC
C560	QCHB1EZ-223	0.022MF 25V	CERAMIC

△ : SAFETY PARTS

Capacitors

ITEM	PART NUMBER	DESCRIPTION	AREA
C561	QCHB1EZ-223	0.022MF 25V CERAMIC	
C601	QFN81HJ-472	4700PF 50V MYLAR	
C602	QFN81HJ-472	4700PF 50V MYLAR	
C603	QCHB1EZ-223	0.022MF 25V CERAMIC	
C604	QCS81HJ-180	18PF 50V CERAMIC	
C605	QCB81HK-471	470PF 50V CERAMIC	
C606	QETB1EM-106	10MF 25V ELECTRO	
C607	QETB1CM-476	47MF 16V ELECTRO	
C608	QFN81HJ-103	0.01MF 50V MYLAR	
C610	QCHB1EZ-223	0.022MF 25V CERAMIC	
C611	QCB81HK-101	100PF 50V CERAMIC	
C651	QCB81HK-101	100PF 50V CERAMIC	
C652	QETB1CM-107	100MF 16V ELECTRO	
C653	QFV81HJ-473	0.047MF 50V T.FILM	
C654	QETB1EM-106	10MF 25V ELECTRO	
C656	QFV81HJ-224	0.22MF 50V T.FILM	
C701	QETB1EM-106	10MF 25V ELECTRO	
C801	QENS1HM-225	2.2MF 50V NON POLE	
C802	QETB1EM-226	22MF 25V ELECTRO	
C803	QETBOJM-227	220MF 6.3V ELECTRO	
C851	QFN81HJ-272	2700PF 50V MYLAR	
C852	QCB81HK-221	220PF 50V CERAMIC	
C853	QFV81HJ-474	0.47MF 50V T.FILM	
C854	QCHB1EZ-223	0.022MF 25V CERAMIC	
C855	QCHB1EZ-223	0.022MF 25V CERAMIC	
C901	QCB81HK-101	100PF 50V CERAMIC	
C902	QCHB1EZ-223	0.022MF 25V CERAMIC	

Δ : SAFETY PARTS

Resistors

ITEM	PART NUMBER	DESCRIPTION	AREA
R334	QRD161J-561	560 1/6W CARBON	
R335	QRD161J-561	560 1/6W CARBON	
R336	QRD161J-271	270 1/6W CARBON	
R337	QRD161J-271	270 1/6W CARBON	
R338	QRD161J-562	5.6K 1/6W CARBON	
R339	QRD161J-562	5.6K 1/6W CARBON	
R340	QRD161J-103	10K 1/6W CARBON	
R341	QRD161J-103	10K 1/6W CARBON	
R344	QRD161J-271	270 1/6W CARBON	
R345	QRD161J-271	270 1/6W CARBON	
R346	QRD161J-102	1K 1/6W CARBON	
R347	QRD161J-102	1K 1/6W CARBON	
R348	QRD161J-684	680K 1/6W CARBON	
R352	QRD161J-473	47K 1/6W CARBON	
R353	QRD161J-103	10K 1/6W CARBON	
R354	QRD161J-101	100 1/6W CARBON	
R355	QRD161J-334	330K 1/6W CARBON	
R380	QRD161J-273	27K 1/6W CARBON	
R381	QRD161J-273	27K 1/6W CARBON	
R382	QRD161J-155	1.5M 1/6W CARBON	
R383	QRD161J-155	1.5M 1/6W CARBON	
R384	QRD161J-124	120K 1/6W CARBON	
R401	QRD161J-123	12K 1/6W CARBON	
R402	QRD161J-181	180 1/6W CARBON	
R403	QRD161J-331	330 1/6W CARBON	
R404	QRD161J-182	1.8K 1/6W CARBON	
R405	QRD161J-331	330 1/6W CARBON	
R407	QRV144F-3302	33K 1/4W M.FILM	
R408	QRV144F-3302	33K 1/4W M.FILM	
R409	QRD161J-183	18K 1/6W CARBON	
R410	QRD161J-103	10K 1/6W CARBON	
R411	QRD161J-183	18K 1/6W CARBON	
R413	QRD161J-152	1.5K 1/6W CARBON	
R414	QRD161J-104	100K 1/6W CARBON	
R415	QRD161J-821	820 1/6W CARBON	
R417	QRD161J-471	470 1/6W CARBON	
R451	QRD161J-472	4.7K 1/6W CARBON	
R452	QRD161J-184	180K 1/6W CARBON	
R453	QRD161J-562	5.6K 1/6W CARBON	
R454	QRD161J-103	10K 1/6W CARBON	
R456	QRD161J-104	100K 1/6W CARBON	
R457	QRD161J-183	18K 1/6W CARBON	
R460	QRD161J-562	5.6K 1/6W CARBON	
R462	QRD161J-273	27K 1/6W CARBON	
R501	QRD161J-563	56K 1/6W CARBON	
R502	QRD161J-563	56K 1/6W CARBON	
R503	QRV144F-4703	470K 1/4W M.FILM	
R504	QRD161J-681	680 1/6W CARBON	
R505	QVPE601-202	2K VARIABLE	
R506	QRD161J-821	820 1/6W CARBON	
R507	QRV144F-4703	47 1/4W M.FILM	
R509	QVPC601-104	100K VARIABLE	
R510	QRD161J-223	22K 1/6W CARBON	
R511	QRD161J-682	6.8K 1/6W CARBON	
R512	QRD161J-103	10K 1/6W CARBON	
R513	QRD161J-562	5.6K 1/6W CARBON	
R514	QRD161J-562	5.6K 1/6W CARBON	
R515	QRD161J-562	5.6K 1/6W CARBON	
R516	QRD161J-562	5.6K 1/6W CARBON	
R517	QRD161J-183	18K 1/6W CARBON	
R518	QRD161J-155	1.5M 1/6W CARBON	
R519	QRD161J-183	18K 1/6W CARBON	
R520	QRD161J-224	220K 1/6W CARBON	
R523	QRD161J-684	680K 1/6W CARBON	
R524	QRD161J-684	680K 1/6W CARBON	
R525	QRD161J-163	16K 1/6W CARBON	
R527	QRD161J-104	100K 1/6W CARBON	
R528	QRD161J-104	100K 1/6W CARBON	
R529	QRD161J-102	1K 1/6W CARBON	
R530	QRD161J-183	18K 1/6W CARBON	
R531	QRD161J-104	100K 1/6W CARBON	
R532	QRD161J-122	1.2K 1/6W CARBON	
R533	QRD161J-272	2.7K 1/6W CARBON	
R534	QRD161J-181	180 1/6W CARBON	
R536	QRD161J-473	47K 1/6W CARBON	
R540	QRD161J-223	22K 1/6W CARBON	
R541	QRD161J-223	22K 1/6W CARBON	
R542	QRD161J-183	18K 1/6W CARBON	
R543	QRD161J-183	18K 1/6W CARBON	
R545	QRD161J-470	47 1/6W CARBON	
R551	QRD161J-392	3.9K 1/6W CARBON	
R552	QRD161J-392	3.9K 1/6W CARBON	
R553	QRD161J-274	270K 1/6W CARBON	
R554	QRD161J-224	220K 1/6W CARBON	
R555	QVPE601-104	100K VARIABLE	

Δ : SAFETY PARTS

(No. 2977) 2-9

Resistors

ITEM	PART NUMBER	DESCRIPTION	AREA
R101	QRD161J-271	270 1/6W CARBON	
R102	QRD161J-102	1K 1/6W CARBON	
R103	QRZ0077-100	10 1/4W FUSIBLE	
R104	QRZ0077-100	10 1/4W FUSIBLE	
R105	QRD161J-122	1.2K 1/6W CARBON	
R106	QRD161J-122	1.2K 1/6W CARBON	
R108	QRD161J-121	120 1/6W CARBON	
R109	QRD161J-121	120 1/6W CARBON	
R110	QRD161J-392	3.9K 1/6W CARBON	
R118	QRD161J-121	120 1/6W CARBON	
R119	QRD161J-121	120 1/6W CARBON	
R120	QRD161J-121	120 1/6W CARBON	
R301	QRD161J-105	1M 1/6W CARBON	
R302	QRD161J-181	180 1/6W CARBON	
R304	QRD161J-181	180 1/6W CARBON	
R305	QRD161J-181	180 1/6W CARBON	
R306	QRD161J-204	200K 1/6W CARBON	
R307	QRD161J-474	470K 1/6W CARBON	
R308	QRD161J-105	1M 1/6W CARBON	
R309	QVPE601-104	100K VARIABLE	
R310	QRD161J-562	5.6K 1/6W CARBON	
R311	QRD161J-562	5.6K 1/6W CARBON	
R312	QRD161J-562	5.6K 1/6W CARBON	
R313	QRD161J-562	5.6K 1/6W CARBON	
R314	QRD161J-181	180 1/6W CARBON	
R315	QRD161J-104	100K 1/6W CARBON	
R316	QRD161J-112	1.1K 1/6W CARBON	
R317	QRD161J-112	1.1K 1/6W CARBON	
R318	QRD161J-112	1.1K 1/6W CARBON	
R319	QRD161J-112	1.1K 1/6W CARBON	
R320	QRD161J-331	330 1/6W CARBON	
R321	QRD161J-331	330 1/6W CARBON	
R322	QRD161J-104	100K 1/6W CARBON	
R323	QRD161J-104	100K 1/6W CARBON	
R324	QRD161J-682	6.8K 1/6W CARBON	
R325	QRD161J-682	6.8K 1/6W CARBON	
R326	QRD161J-302	3K 1/6W CARBON	
R327	QRD161J-302	3K 1/6W CARBON	
R328	QRD161J-512	5.1K 1/6W CARBON	
R329	QRD161J-512	5.1K 1/6W CARBON	
R330	QRD161J-432	4.3K 1/6W CARBON	
R331	QRD161J-432	4.3K 1/6W CARBON	
R332	QRD161J-273	27K 1/6W CARBON	
R333	QRD161J-273	27K 1/6W CARBON	

Δ : SAFETY PARTS

Resistors

△	ITEM	PART NUMBER	DESCRIPTION	AREA
	R557	QRD161J-102	1K 1/6W CARBON	
	R558	QRD161J-393	39K 1/6W CARBON	
	R559	QRD161J-471	470 1/6W CARBON	
	R560	QRD161J-333	33K 1/6W CARBON	
	R561	QRD161J-153	15K 1/6W CARBON	
	R562	QRD161J-154	150K 1/6W CARBON	
	R567	QRD161J-105	1M 1/6W CARBON	
	R568	QRD161J-470	47 1/6W CARBON	
	R569	QRD161J-473	47K 1/6W CARBON	
	R570	QRD161J-272	2.7K 1/6W CARBON	
	R571	QRD161J-472	4.7K 1/6W CARBON	
	R572	QRD161J-104	100K 1/6W CARBON	
	R573	QRD161J-562	5.6K 1/6W CARBON	
	R574	QRD161J-105	1M 1/6W CARBON	
	R575	QRD161J-105	1M 1/6W CARBON	
	R576	QRD161J-104	100K 1/6W CARBON	
	R577	QRD161J-472	4.7K 1/6W CARBON	
	R579	QRD161J-104	100K 1/6W CARBON	
	R580	QRD161J-103	10K 1/6W CARBON	
	R581	QRD161J-103	10K 1/6W CARBON	
	R582	QRD161J-183	18K 1/6W CARBON	
	R583	QRD161J-155	1.5M 1/6W CARBON	
	R585	QRD161J-183	18K 1/6W CARBON	
	R589	QRD161J-822	8.2K 1/6W CARBON	
	R590	QRD161J-470	47 1/6W CARBON	
	R601	QRD161J-183	18K 1/6W CARBON	
	R602	QRD161J-272	2.7K 1/6W CARBON	
	R603	QRD161J-391	390 1/6W CARBON	
	R604	QRD161J-221	220 1/6W CARBON	
	R605	QRD161J-152	1.5K 1/6W CARBON	
	R606	QRD161J-561	560 1/6W CARBON	
	R607	QRD161J-561	560 1/6W CARBON	
	R608	QRD161J-562	5.6K 1/6W CARBON	
	R609	QRD161J-152	1.5K 1/6W CARBON	
	R610	QRD161J-271	270 1/6W CARBON	
	R611	QRD161J-102	1K 1/6W CARBON	
	R651	QRD161J-103	10K 1/6W CARBON	
	R652	QRD161J-272	2.7K 1/6W CARBON	
	R653	QRD161J-101	100 1/6W CARBON	
	R656	QRD161J-271	270 1/6W CARBON	
	R657	QRD161J-103	10K 1/6W CARBON	
	R658	QRD161J-562	5.6K 1/6W CARBON	
	R659	QRD161J-103	10K 1/6W CARBON	
	R660	QRD161J-682	6.8K 1/6W CARBON	
	R661	QRD161J-103	10K 1/6W CARBON	
	R663	QRD161J-471	470 1/6W CARBON	
	R701	QRD161J-563	56K 1/6W CARBON	
	R702	QRD161J-563	56K 1/6W CARBON	
	R703	QRD161J-104	100K 1/6W CARBON	
	R704	QRD161J-104	100K 1/6W CARBON	
	R801	QRD161J-184	180K 1/6W CARBON	
	R802	QRD161J-274	270K 1/6W CARBON	
	R803	QRD161J-123	12K 1/6W CARBON	
	R804	QRD161J-184	180K 1/6W CARBON	
	R805	QRD161J-562	5.6K 1/6W CARBON	
	R806	QRD161J-392	3.9K 1/6W CARBON	
	R808	QRD161J-103	10K 1/6W CARBON	
	R809	QRD161J-102	1K 1/6W CARBON	
	R810	QRD161J-471	470 1/6W CARBON	
	R811	QRD161J-184	180K 1/6W CARBON	
	R812	QRD161J-183	18K 1/6W CARBON	
	R813	QRD161J-273	27K 1/6W CARBON	
	R851	QRD161J-684	680K 1/6W CARBON	
	R852	QRD161J-684	680K 1/6W CARBON	
	R853	QRD161J-104	100K 1/6W CARBON	
	R855	QRD161J-563	56K 1/6W CARBON	
	R856	QRD161J-473	47K 1/6W CARBON	
	R857	QRD161J-103	10K 1/6W CARBON	
	R858	QRD161J-2R2	2.2 1/6W CARBON	
	R901	QRD161J-471	470 1/6W CARBON	
	RA601	ERB045J-4722	R.NETWORK	

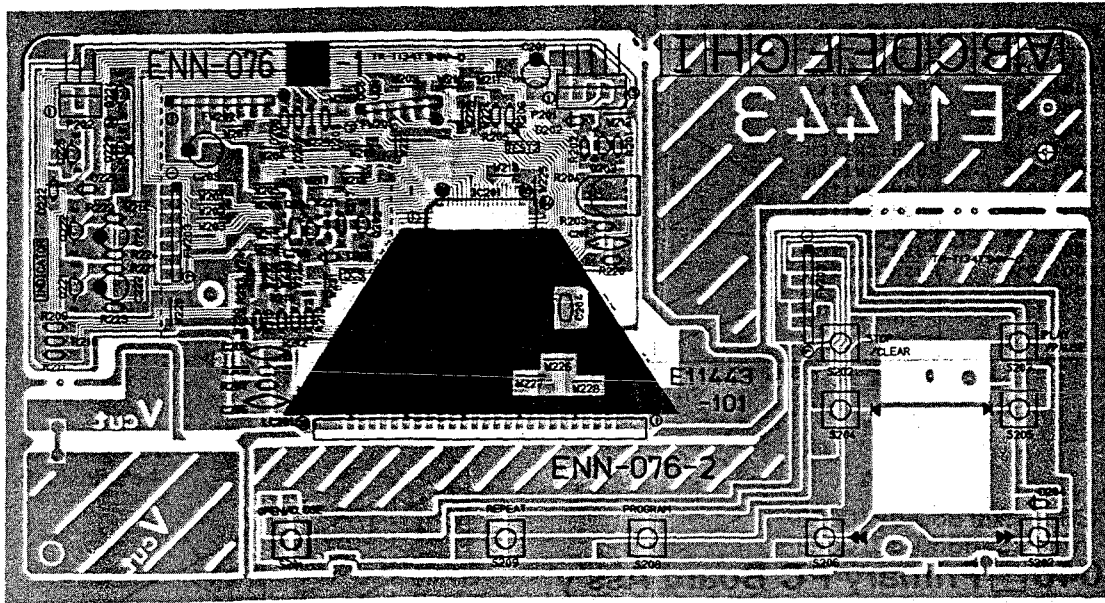
△ : SAFETY PARTS

Others

△	ITEM	PART NUMBER	DESCRIPTION	AREA
		EMG7331-002U	FUSE CLIP	
		EMG7331-002	FUSE CLIP	
		E11456-001	CIRCUIT BOARD	
		E70306-001	HEAT SINK	
		SBSE3008CC	SCREW	
	L303	EQL4004-1R0Y	INDUCTOR	
	L401	EN23001-002	OSC COIL	
	P101	EMV7112-004	SOCKET	
	P301	EMN00TV-201A	PIN JACK ASSY	
	P303	QMS3533-001A	JACK ASSY	
	P501	EMV5109-012A	12P PLUG ASSY	
	P502	EMV5109-004A	4P PLUG ASSY	
	P801	EMV7112-008	SOCKET	
	P802	EMV7112-006	SOCKET	
	P803	QMV5005-006K	PULAG ASSY	
	X301	ECX0086-436EF	X.TAL	
	CP101	ICP-N20	IC PROTECTOR	
	CP102	ICP-N20	IC PROTECTOR	

△ : SAFETY PARTS

■ ENN-076 B Front PC Board Ass'y



Transistors

△	ITEM	PART NUMBER	DESCRIPTION	AREA
			MAKER	
	Q201	DTC144EN	SILICON	ROHM
	Q202	DTA114YN	SILICON	ROHM
	Q203	2SA933(R,S)	SILICON	ROHM

△ : SAFETY PARTS

Capacitors

△	ITEM	PART NUMBER	DESCRIPTION	AREA
	C201	GETB1AM-476	47MF 10V	ELECTRO
	C202	QCS21HJ-470	47PF 50V	CERAMIC
	C203	GETB1AM-476	47MF 10V	ELECTRO
	C204	QCHB1EZ-223	0.022MF 25V	CERAMIC
	C205	QCF21HP-223	0.022MF 50V	CERAMIC
	C206	QCF21HP-223	0.022MF 50V	CERAMIC

△ : SAFETY PARTS

ICs

△	ITEM	PART NUMBER	DESCRIPTION	AREA
			MAKER	
	IC201	UPD7514G-209-12	I.C.	NEC

△ : SAFETY PARTS

Resistors

△	ITEM	PART NUMBER	DESCRIPTION	AREA
	R201	GRD161J-152	1.5K 1/6W	CARBON
	R202	GRD161J-332	3.3K 1/6W	CARBON
	R203	GRD161J-303	30K 1/6W	CARBON
	R204	GVPE601-5022	5K	VARIABLE
	R205	GRD161J-333	33K 1/6W	CARBON
	R206	GRD161J-333	33K 1/6W	CARBON
	R207	GRD161J-103	10K 1/6W	CARBON
	R208	GRD161J-103	10K 1/6W	CARBON
	R209	GRD161J-472	4.7K 1/6W	CARBON
	R210	GRD161J-472	4.7K 1/6W	CARBON
	R211	GRD161J-472	4.7K 1/6W	CARBON
	R212	GRD161J-473	47K 1/6W	CARBON
	R213	GRD161J-473	47K 1/6W	CARBON
	R214	GRD161J-473	47K 1/6W	CARBON
	R215	GRD161J-473	47K 1/6W	CARBON
	R217	GRD161J-472	4.7K 1/6W	CARBON
	R220	GRD161J-103	10K 1/6W	CARBON
	R233	GRD161J-392	3.9K 1/6W	CARBON

△ : SAFETY PARTS

Diodes

△	ITEM	PART NUMBER	DESCRIPTION	AREA
			MAKER	
	D201	1SS133	SILICON	ROHM
	D202	1SS133	SILICON	ROHM
	D203	1SS133	SILICON	ROHM
	D204	1SS133	SILICON	ROHM
	D205	1SS133	SILICON	ROHM
	D206	1SS133	SILICON	ROHM

△ : SAFETY PARTS

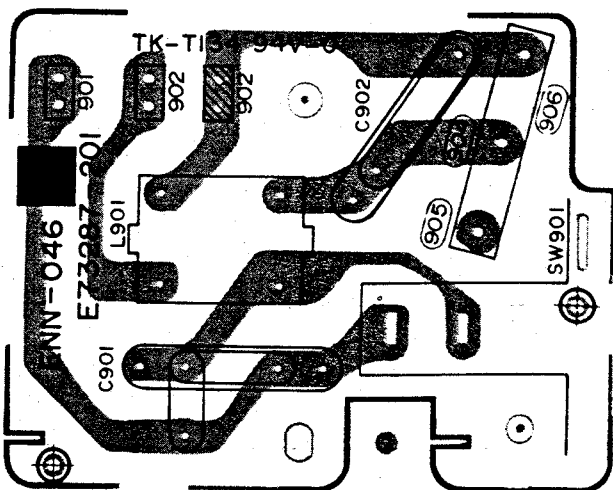
Others

△	ITEM	PART NUMBER	DESCRIPTION	AREA
	P201	E11443-101	CIRCUIT BOARD	
	S201	QMV5004-005K	PULAG ASSY	
	S202	ESP0001-014	PUSH SWITCH	
	S203	ESP0001-014	PUSH SWITCH	
	S204	ESP0001-014	PUSH SWITCH	
	S205	ESP0001-014	PUSH SWITCH	
	S206	ESP0001-014	PUSH SWITCH	
	S207	ESP0001-014	PUSH SWITCH	
	S208	ESP0001-014	PUSH SWITCH	
	S209	ESP0001-014	PUSH SWITCH	
	LC201	ELU0002-037	LCD PANEL	B

△ : SAFETY PARTS

■ ENN-046 □ Primary PC Board Ass'y

Note: ENN-046 □ varies according to the areas employed. See note (1) when placing an order.



Note (1)

P.C. Board Ass'y	Designated Areas
ENN-046■	U.S. Military Market & Other Countries
ENN-046□	Europe, Australia, Spain, Spain, West Germany
ENN-046□BS	U.K.

Capacitors

△	ITEM	PART NUMBER	DESCRIPTION	AREA
	C901	QCZ9018-103	0.01MF CERAMIC	B
	C901	QCZ9038-103	0.01MF CERAMIC	C
	C901	QCZ9038-103BS	0.01MF CERAMIC	DBS
	C902	QFZ9010-223	0.022MF MYLAR	C
	C902	QFZ9020-223	0.022MF MYLAR	B
	C902	QFZ9020-223BS	0.022MF MYLAR	DBS

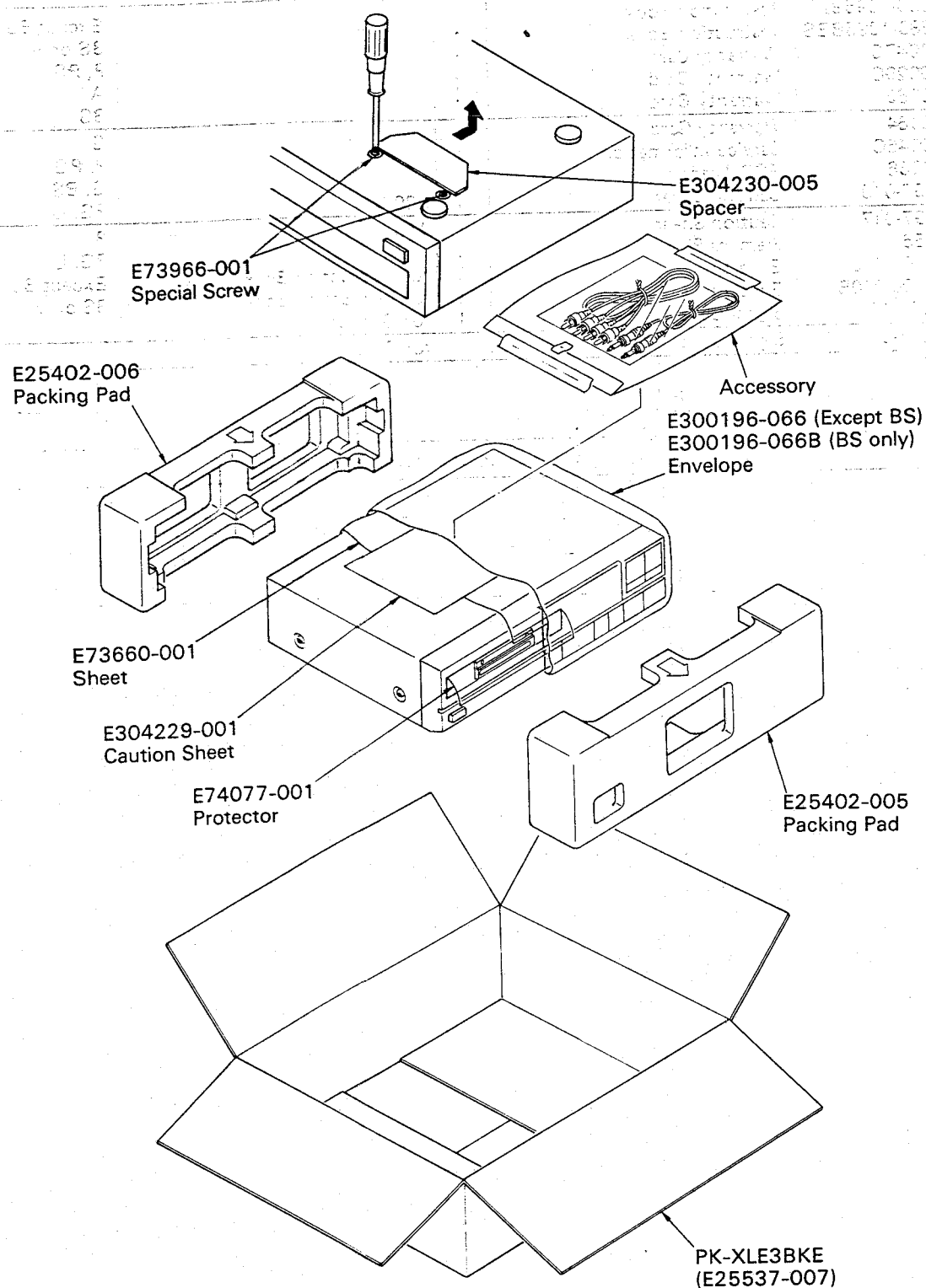
△ : SAFETY PARTS

Others

△	ITEM	PART NUMBER	DESCRIPTION	AREA
		E65508-002	TAB	
		E67764-203	TERMINAL ASSY	
		E73287-201	CIRCUIT BOARD	B
		E73287-201	CIRCUIT BOARD	C
		E73287-201BS	CIRCUIT BOARD	DBS
		QSP1106-004	PUSH SWITCH	B
		QSP1106-004	PUSH SWITCH	C
		QSP1106-004BS	PUSH SWITCH	DBS
	L901	ENZ5002-004	LINE FILTER	B
	L901	ENZ5002-004	LINE FILTER	C
	L901	ENZ5002-004BS	LINE FILTER	DBS

△ : SAFETY PARTS

Packing Materials and Parts Numbers



The Marks for Designated Areas

A	Australia	ES.	Spain
E	Europe	P, PG	U.S. Military Market
G	West Germany	U	Other Countries
BS.	U.K.	No Mark indicates all areas.	

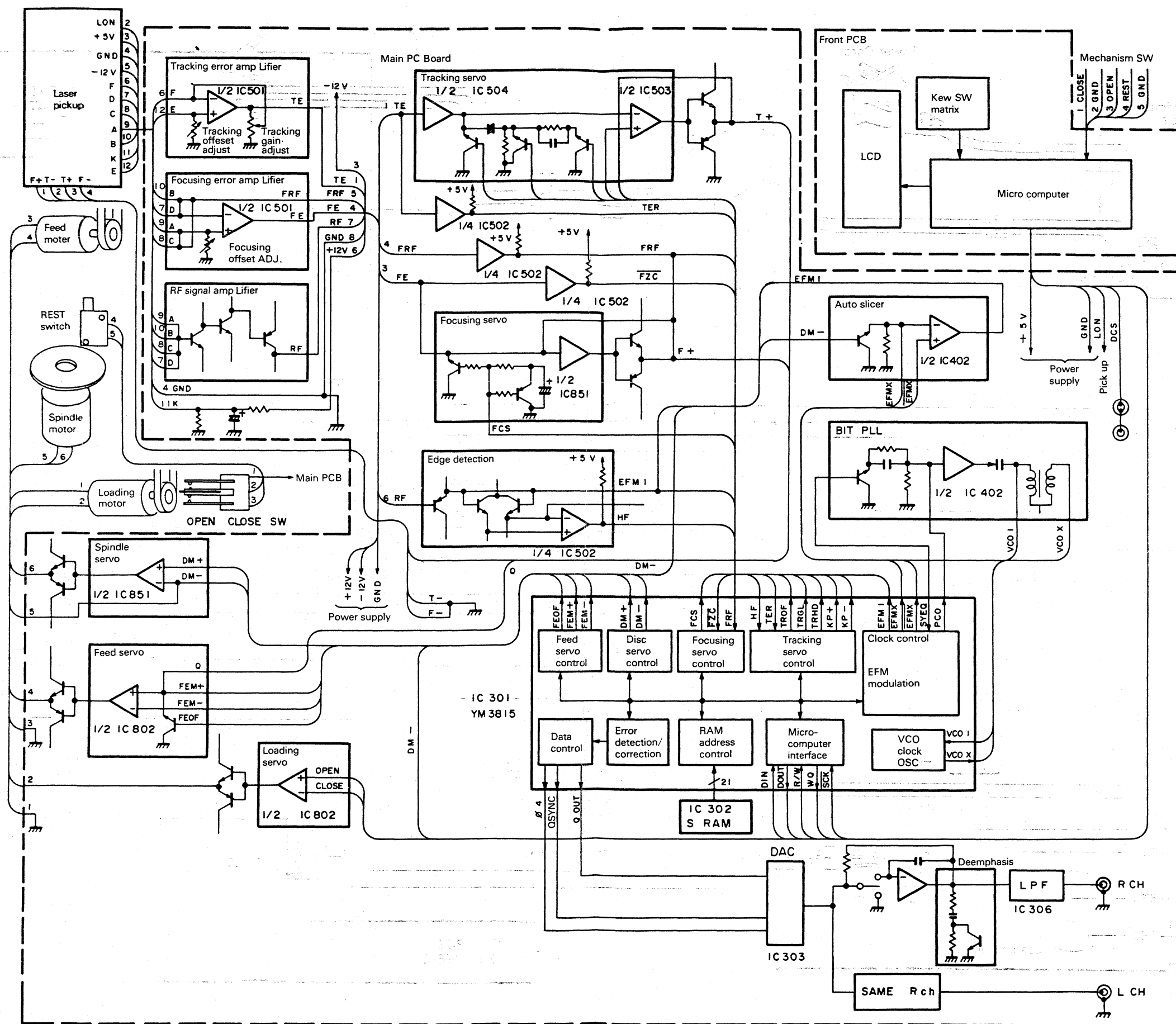
Accessories

	Parts Number	Parts Name	Q'ty	Description	Areas
	E30580-1395B	Instruction Book	1		Except BS
	E30580-1395BBS	Instruction Book	1		BS only
	BT20047C	Warranty Card	1		P, PG
	BT20029C	Warranty Card	1		A
	BT20060	Warranty Card	1		BS
	BT20064	Warranty Card	1		G
	BT20046C	Service Information	1		P, PG
	BT20066	ECC Agency	1		G, BS
	E35497-019	Caution Sheet	1	220 V	PG, U
	E35497-017	Caution Sheet	1	110 V	P
	E04056	Siemens Plug	1		PG, U
	E300196-010	Envelope	1	for Instruction Book	Except BS
	E300196-010B	Envelope	1	for Instruction Book	BS only
	EWP302-101	Signal Cord	1	for Output	
	EWP805-001	Signal Cord	1	for DCS	

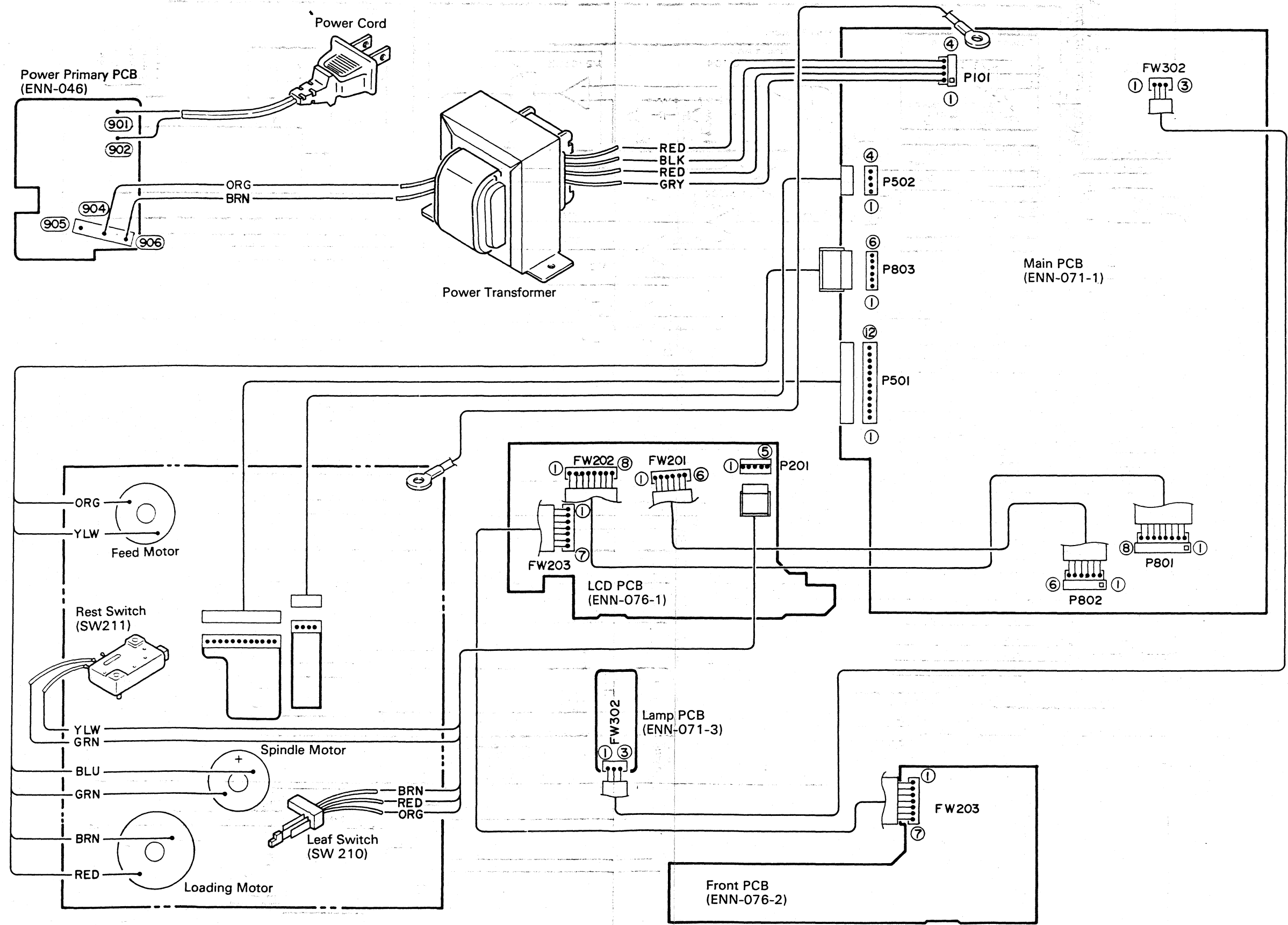
 : Safety Parts

The Marks for Designated Areas			
A	Australia	ES	Spain
E	Europe	P, PG	U.S. Military Market
G	West Germany	U	Other Countries
BS	U.K.	No Mark indicates all areas.	

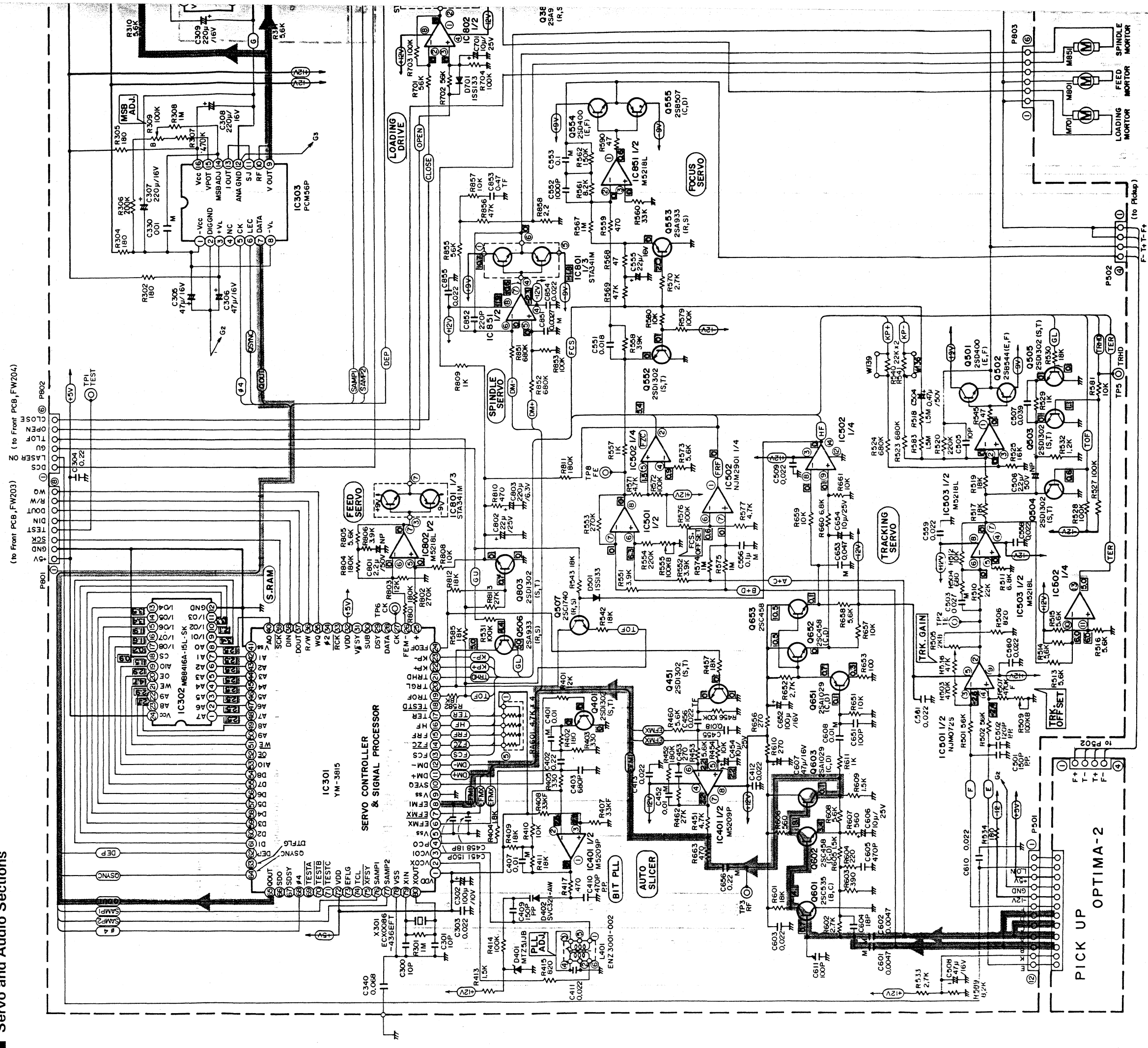
Block Diagram

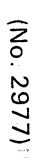


Connection Diagram

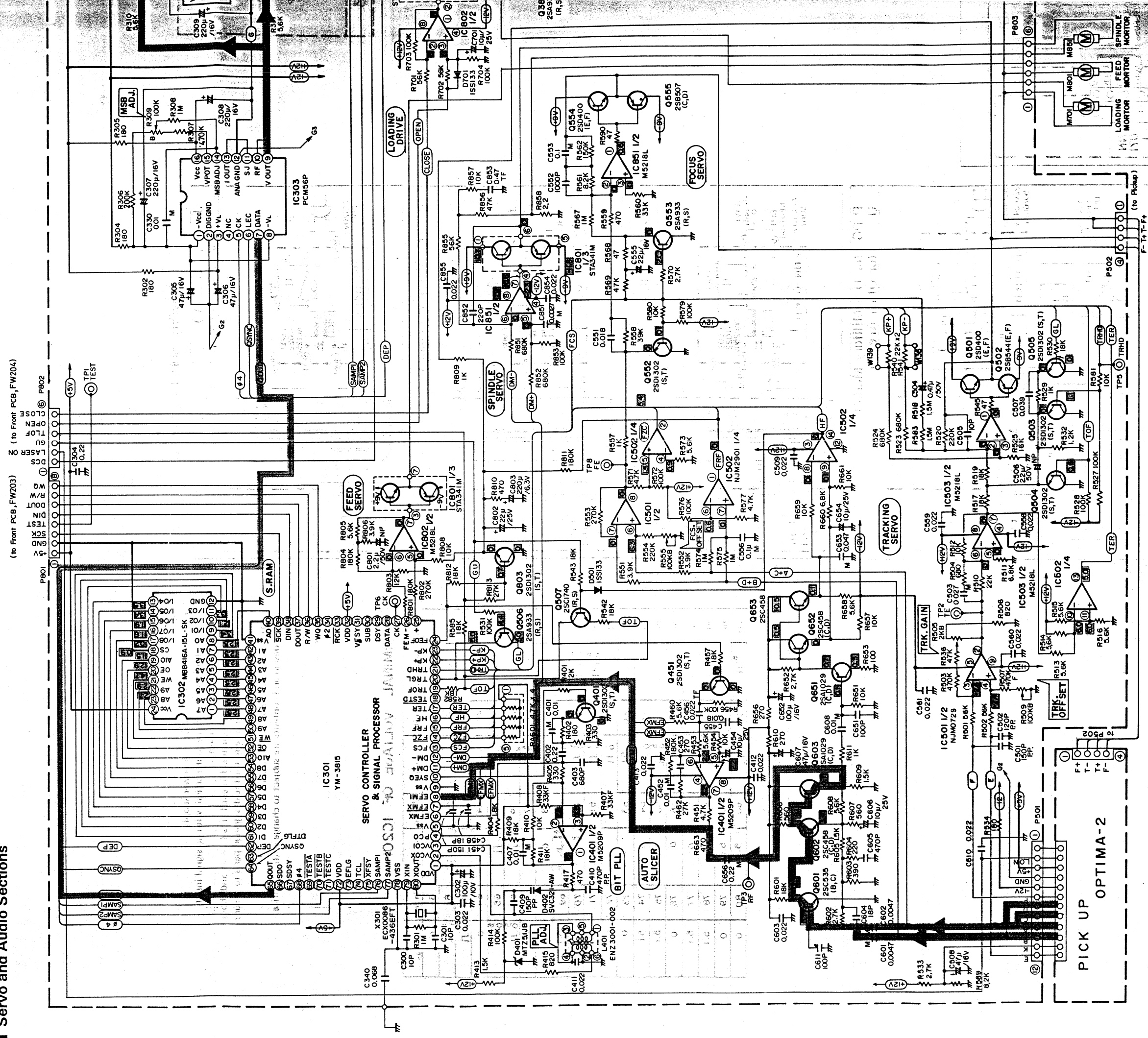


■ Servo and Audio Sections



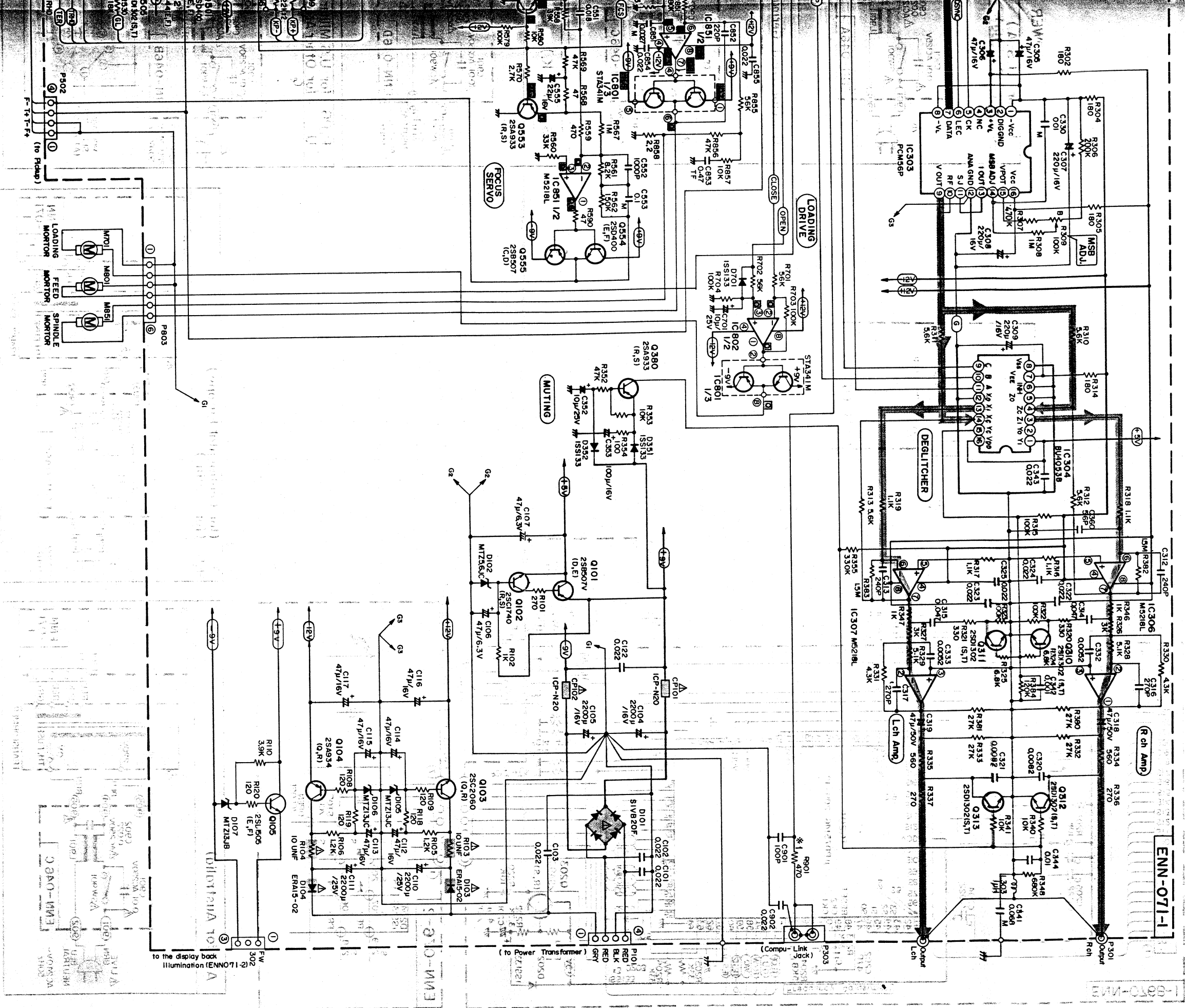


■ Servo and Audio Sections



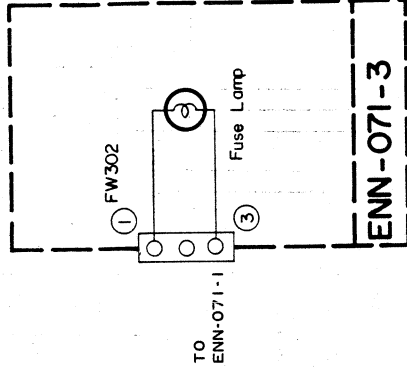
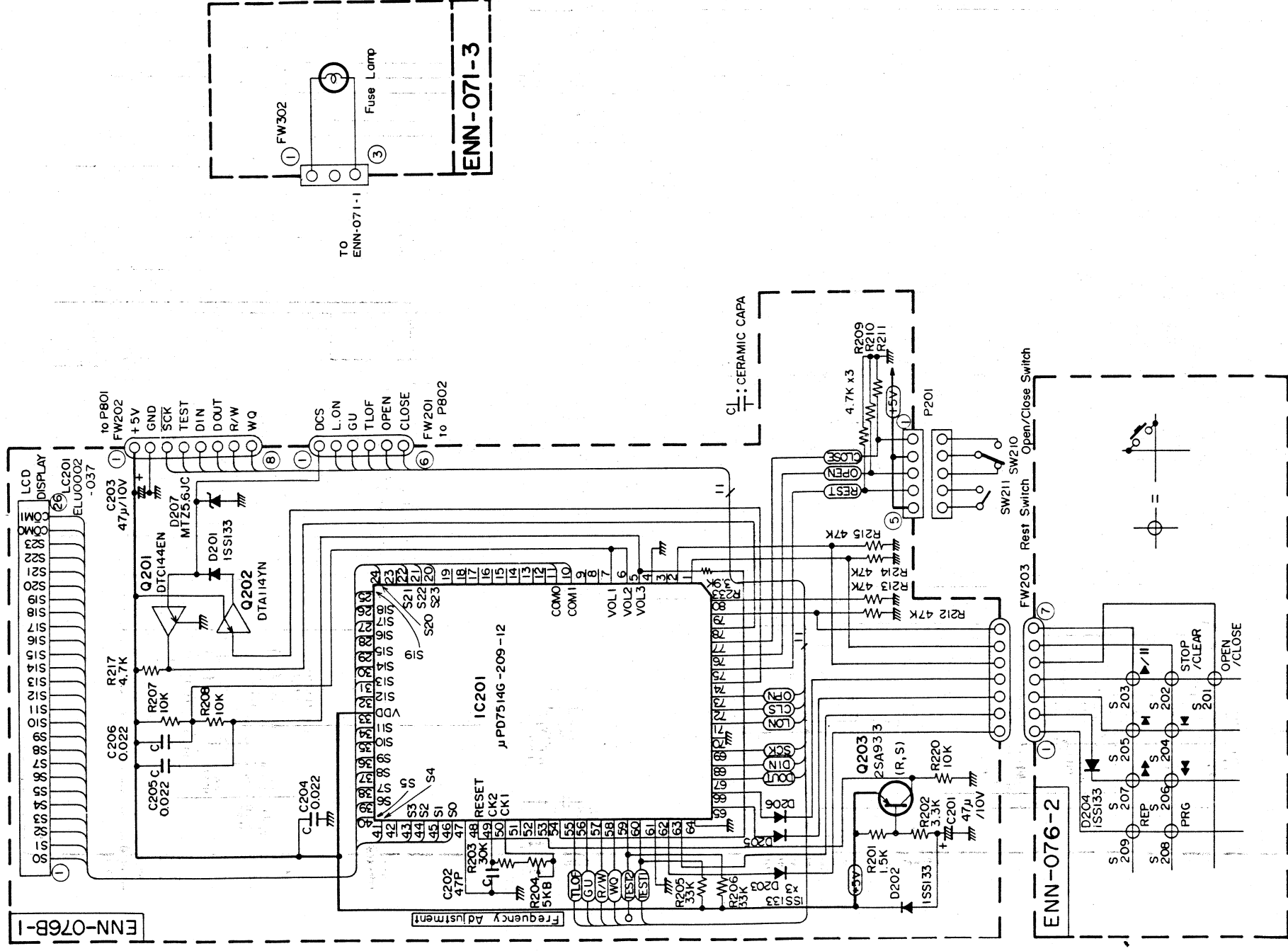
QUID circuitry

QUID circuitry

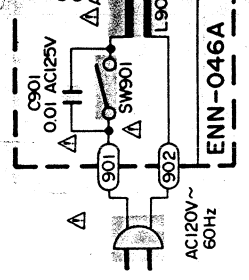


Schematic Diagrams

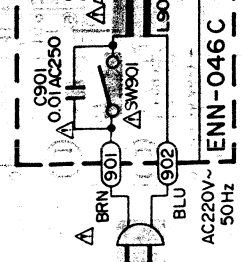
■ Front and Power Supply Sections



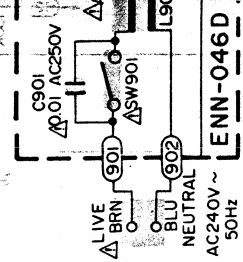
POWER
J (for U.S.A.)
C (for Canada)



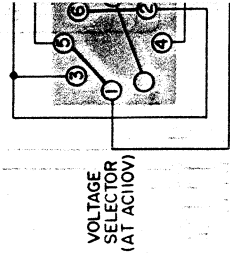
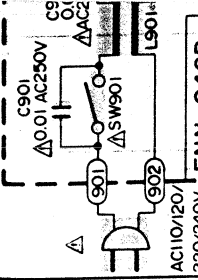
G (for West Ger)



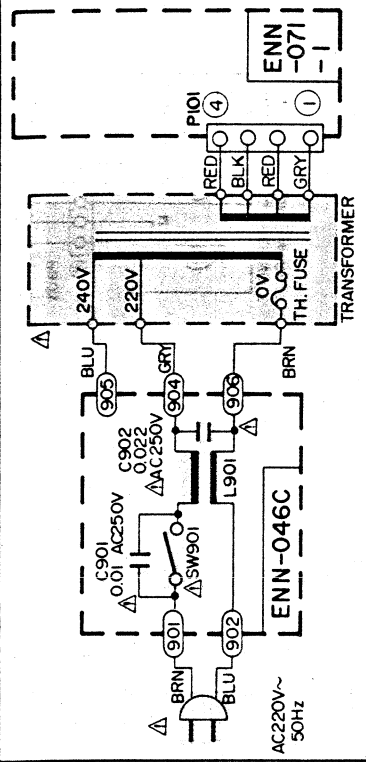
BS (for U.K.)



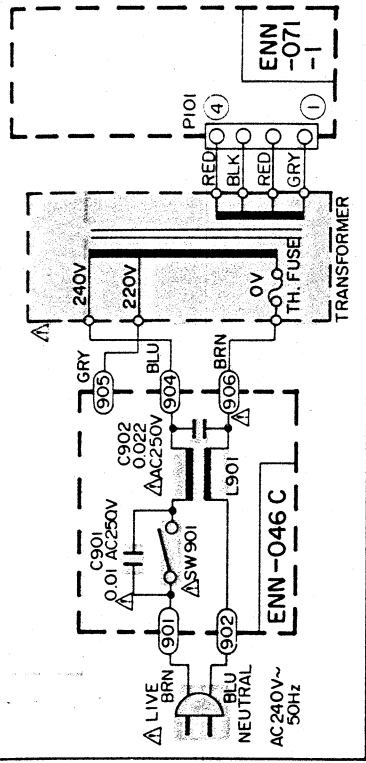
P,PG (for U.S.Mi)
U (for Other)



E (for Continental Europe)
ES (for Spain)

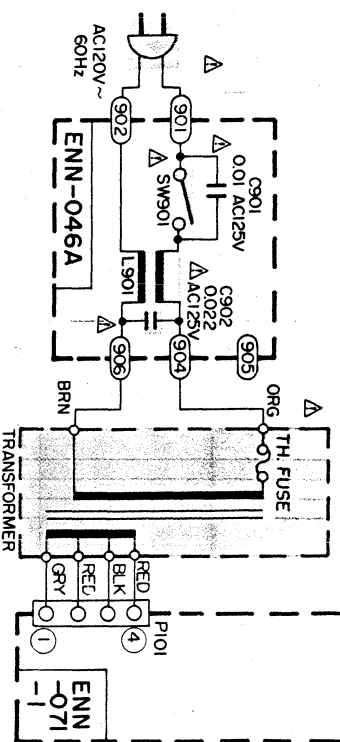


A (for Australia)

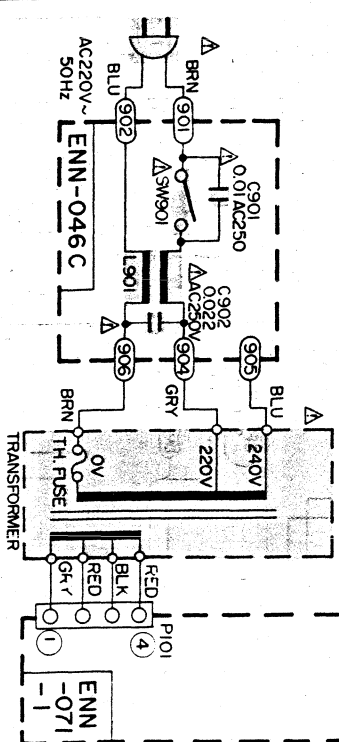


POWER SUPPLY BLOCK

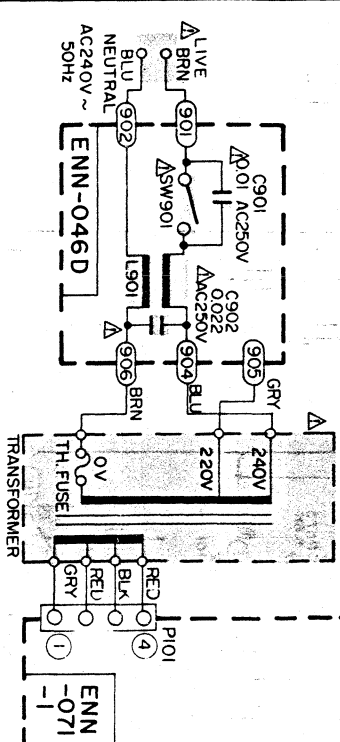
J (for U.S.A.)
C (for Canada)



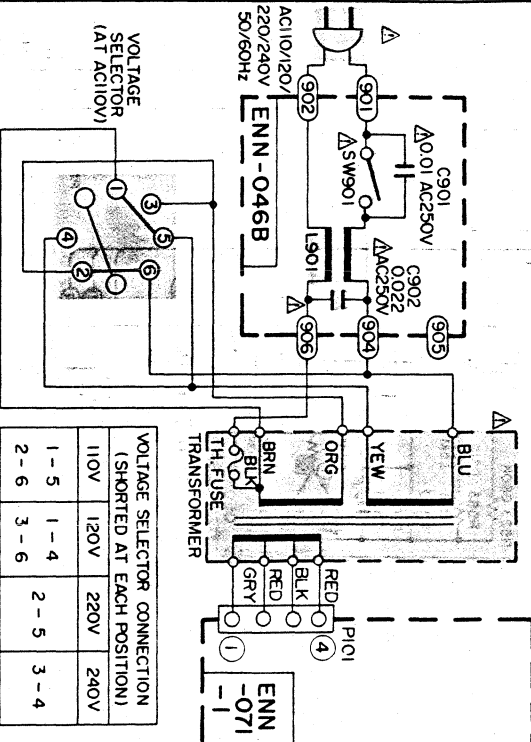
G (for West Germany)



BS (for U.K.)



P, PG (for U.S. Military Market)
U (for Other Areas)



VOLTAGE SELECTOR CONNECTION (SHORTED AT EACH POSITION)	110V	120V	220V	240V
1 - 5	1 - 4	2 - 5	3 - 4	
2 - 6	3 - 6			

- Notes:
1. — indicates positive $\pm$ B power supply.
 2. — shows DC voltage to the chassis with no signal input.
 3. — indicates signal path.
 4. When replacing the parts in the darkened area () and those marked with Δ , be sure to use the designated parts to ensure safety.
 5. This is the standard circuit diagram. The design and contents are subject to change without notice.

TERMINAL VOLTAGE OF IC201

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	21	$\frac{5}{0}\Omega$	41	$\frac{5}{0}\Omega$	61	0
2	0	22	$\frac{5}{0}\Omega$	42	—	62	$\frac{5}{0}\Omega$
3	—	23	—	43	$\frac{5}{0}\Omega$	63	$\frac{5}{0}\Omega$
4	0	24	$\frac{5}{0}\Omega$	44	$\frac{5}{0}\Omega$	64	0
5	0.9	25	$\frac{5}{0}\Omega$	45	$\frac{5}{0}\Omega$	65	$\frac{5}{0}\Omega$
6	2.5	26	$\frac{5}{0}\Omega$	46	$\frac{5}{0}\Omega$	66	$\frac{5}{0}\Omega$
7	2.5	27	$\frac{5}{0}\Omega$	47	0	67	0
8	—	28	$\frac{5}{0}\Omega$	48	0	68	5.1
9	—	29	$\frac{5}{0}\Omega$	49	$\frac{5}{0}\Omega$	69	5.1
10	$\frac{5}{0}\Omega$	30	$\frac{5}{0}\Omega$	50	$\frac{5}{0}\Omega$	70	0
11	$\frac{5}{0}\Omega$	31	$\frac{5}{0}\Omega$	51	—	71	0
12	—	32	$\frac{5}{0}\Omega$	52	—	72	0
13	—	33	5.1	53	—	73	0
14	—	34	$\frac{5}{0}\Omega$	54	0	74	5.1
15	—	35	$\frac{5}{0}\Omega$	55	5	75	5.1
16	—	36	$\frac{5}{0}\Omega$	56	0	76	0
17	—	37	$\frac{5}{0}\Omega$	57	0	77	5.1
18	—	38	$\frac{5}{0}\Omega$	58	0	78	5.1
19	—	39	$\frac{5}{0}\Omega$	59	5.1	79	0
20	$\frac{5}{0}\Omega$	40	$\frac{5}{0}\Omega$	60	5.1	80	0